

XVI. *Synopsis of the British Heterogyna and Fossorial Hymenoptera.* By EDWARD SAUNDERS, F.L.S.

[Read November 3rd, 1880.]

(Plates VII. and VIII.)

It is now about twenty-two years since the late Mr. F. Smith published his descriptive Catalogue of the British Fossorial Hymenoptera, &c., and since that time so many new species have been discovered, and so many alterations have been made in the synonymy of the species then known, that I thought the short treatise, which I now offer to the Society, giving the more modern views of the subject, might not be unacceptable.

In it I have endeavoured to give brief and concise descriptions of each genus and species, accompanied by synoptical tables showing their differential characters in a few sentences.

It is, however, often very difficult to find words which will express the distinctive characters tersely enough for the purposes of such tables, and I hope that, in any cases where the tabulated characters may appear insufficient, the actual descriptions will be consulted, where the differences are pointed out more fully.

The book which has been of more assistance to me than any other in preparing this Synopsis is Thomson's 'Hymenoptera Scandinaviæ;' the aptitude of its author for discovering small structural characters, most of which are really important, although often difficult to find, is truly wonderful, and I have to thank him for many of the characters here employed.

I have omitted a good many species given by F. Smith, which appear to me to have little or no claim to a place in our fauna. Some of these he has himself left out in his Catalogue, published by this Society in 1871.

Altogether I have described 30 species of Heterogyna and 121 species of Fossores. F. Smith, in his last Catalogue, gives 35 species of Heterogyna and 119 of Fossores; but then he places *Mutilla*, *Myrmosa*, and *Methoca* in the Heterogyna, which I have placed in the Fossores. His reason for doing this I have never been able to understand, as the Mutillidæ appear to me to have neither the structure nor the habits of the

Heterogyna, and certainly, as far as we know, do not possess two forms of the female, as the name Heterogyna implies ; except in this case I have altered but very little the general arrangement of the families.

I cannot conclude this without acknowledging how much I owe to the kindness and friendship of the late Mr. Smith ; he was always willing to give all the information that he possibly could, and never seemed to mind how often one troubled him. I must also thank Messrs. Bridgman, Cameron, Dale, V. Perkins, Billups, Service, and others for the kind manner in which they have lent me specimens, and helped me with observations, &c.

I hope shortly to publish a similar Synopsis of our British Wasps and Bees.

HYMENOPTERA.

ACULEATA.

- Hairs simple, or in some cases twisted, but not branched
or plumose *Section 1.*
Hairs more or less branched or plumose, at least those on
the thorax *Section 2.*

I have been obliged to adopt the character of the hairs for my primary division, as I can find no other satisfactory structural character.

SECTION I.

- (2) 1. Petiole of the abdomen with one or more scales or
nodes ; sexes consisting of ♂, ♀, and ☿ .. *Heterogyna.*
(1) 2. Petiole of the abdomen simple ; sexes consisting of
♂ and ♀ only.
(4) 3. Wings not folded longitudinally *Fossores.*
(3) 4. Wings (at rest) folded longitudinally *Diptera.*

HETEROGYNA.

The form of the abdomen in the Heterogyna, or Ants, easily distinguishes them from any other family of the Hymenoptera. The 1st segment in the Formicidæ and Poneridæ and the 1st and 2nd in the Myrmicidæ are narrowed so as to form a distinct petiole, the single joint in the Formicidæ, &c., bearing a transverse upright scale, each of the two joints in the Myrmicidæ forming a distinct elevated node. All the sexes in the Formicidæ are stingless, whereas the ♀ and ☿ of

the Poneridæ and Myrmicidæ are aculeate. The pupæ of *Formica* and *Ponera* are generally contained in silken cocoons; those of the Myrmicidæ are always naked. All the species possess three sexes, ♂, ♀, and ♀. The ♂ and ♀ have wings; the ♀ is always apterous; the wings of the ♀ are pulled off by the ♀ or cast, after impregnation.

- (4) 1. Petiole with a single transverse scale or node.
- (3) 2. Abdomen not constricted between the 1st and 2nd segments; ♀ and ♀ without a sting .. *Formicidæ*.
- (2) 3. Abdomen constricted between the 1st and 2nd segments; ♀ and ♀ with a sting *Poneridæ*.
- (1) 4. Petiole with two nodes *Myrmicidæ*.

FORMICIDÆ.

- (4) 1. Petiole with an erect scale.
- (3) 2. ♂ 1st joint of flagellum not thicker than the rest; ♀ and ♀ with the 1st joint of the flagellum as long as or longer than the apical *Formica*.
- (2) 3. ♂ 1st joint of flagellum much thicker than the rest; ♀ and ♀ with the 1st joint of the flagellum shorter than the apical *Lasius*.
- (1) 4. Petiole without an erect scale *Tapinoma*.

FORMICA, *Linn.* (Pl. VII. figs. 1 and 2).

Syst. Nat. ed. x. vol. i. p. 579.

♂ and ♀ about equal in size; ♀ very variable in this respect, the ♀ major, as it has been called, being often more than half as large again as the ♀ minor. Pupæ enclosed in silken cocoons; ♀ and ♀ without stings. Maxillary palpi with six joints, labial with four. Antennæ 13-jointed in the ♂, 12-jointed in the ♀ and ♀. Mandibles generally somewhat slender in the ♀, wide and triangular in the ♀ and ♀, much narrowed at the base. Upper wings with one marginal, two submarginal, and one discoidal cells, the apical margin of the 2nd submarginal being the actual edge of the wing. Petiole with an erect, flattened scale, generally more or less triangular, widest above.

The species of this genus are rather naturally divided into two sections by their habits, the first four making their nests above ground, the last three underground.

Messrs. Emery and Forel consider the last three to be all races of one species.

- (2) 1. Head more or less emarginate posteriorly .. *exsecta*.
 (1) 2. Head not emarginate posteriorly.
 (4) 3. Clypeus emarginate *sanguinea*.
 (3) 4. Clypeus not emarginate.
 (8) 5. Frontal area polished..
 (7) 6. Eyes not hairy in ♀ and ♂, sparsely so in ♂, which has the body with only a few scattered hairs *rufa*.
 (6) 7. Eyes hairy in ♀ and ♂, densely so in ♂, which has the body covered with upright hairs .. *congerens*.
 (5) 8. Frontal area dull.
 (10) 9. Abdomen shining, without a silky pubescence .. *gagates*.
 (9) 10. Abdomen with a silky pubescence.
 (12) 11. ♂ body without metallic tinge; ♀ body closely punctured; ♂ thorax more or less red .. *cunicularia*.
 (11) 12. ♂ body with a metallic tinge; ♀ body with scattered punctures; ♂ thorax not reddish at all *fusca*.

1. *rufa*, Linn. Syst. Nat. ed. x. 1, p. 580, No. 2. Fig. Smith Cat. Brit. Foss. Hym. pl. i. fig. 1, 2, 3, &c.

♂ black-brown; legs and genital segments testaceous: base of femora, tibiae, and tarsi sometimes darker; head, prothorax and mesothorax, and sides of metathorax, dull; the rest more or less shining. Head and thorax covered with fine semi-erect hairs. Mandibles not toothed; eyes with scattered hairs. Abdomen widest at the base, somewhat egg-shaped, surface very indistinctly and somewhat rugosely punctured, with a few hairs on the basal and apical segments. Wings clouded with brown at the base; nerves brown. Length 10—12 mill.

♀ brown: head, with the exception of the vertex and a central stripe, prothorax, metathorax, and sometimes sides of mesothorax, petiole, and extreme base of abdomen and legs testaceous-red. Head and thorax dull; wings slightly clouded at the base; scutellum and abdomen polished and shining. Eyes not hairy. Apical segment of the abdomen and the under side with somewhat long hairs. Length 10 mill.

♂ entirely dull, except the frontal area and parts of the mouth; head widest behind the eyes; not excavated or constricted posteriorly; red, with a brownish spot covering the vertex, and extending widely between the eyes to the insertion of the antennæ; clypeus not emarginate, with a dark central line; antennæ brown; thorax with only a few scattered bristly hairs, red, more or less clouded on the pro- and mesothorax. Abdomen

brown-black, covered with a very short, fine, cinereous pubescence, and scattered over with occasional upright silvery hairs, especially on the basal segment; scale of the petiole red, more or less rounded above, and sometimes slightly emarginate; legs reddish. Length 6—10 mill.

Hab.—Common in fir woods, &c., generally forming its dome-like nest on the ground, but occasionally in the trunk of an old tree; the ♂ and ♀ appear about midsummer. In the nest of this ant is found occasionally, another of our rarer species the *Stenammina Westwoodii*; on the Continent, *Diplophoptrum fugax*, is also found with it.

2. *congerens*, Nyl. Act. Soc. Fenn. (1846), 2, p. 906.

♂ differs from *rufa* in having the eyes more densely and regularly hairy, the wings with pale yellowish nerves at the base, and less clouded; the abdomen dull, and all the segments above with black bristly hairs.

♀ differs in having the eyes with very short, scattered, fine hairs, and the abdomen covered with a very fine short sericeous adpressed grey pubescence. Scutellum dull.

♂ differs in having the thorax comparatively densely covered with hairs, and the eyes hairy.

Hab.—Loch Rannoch and Bournemouth, and probably elsewhere, but overlooked.

Forel and Emery consider this as only a race of *rufa*.

3. *sanguinea*, Ltr. Essai Fourmis France, p. 37.

Resembling *rufa*, but ♂ and ♀ much brighter in colouring.

♂ differs in having the mandibles with three to five teeth, and the clypeus emarginate; the thorax also has only a few isolated bristly hairs. Length 9 mill.

♀ differs in the brightness and extent of the red colour, the thorax sometimes being entirely red, and in having the clypeus emarginate, and the frontal area dull. Length 9—10 mill.

♂ differs much in the same respects as the female; the thorax is generally unspotted, and the legs bright clear testaceous-red; the clypeus emarginate, and the frontal area dull. Some of the pale varieties of *cuni-*

cularia resemble it closely in colour, and in the dull frontal area, but the simple clypeus will distinguish them at once. Length 5—9 mill.

Hab.—Weybridge, Chobham, Hawley Hants, New Forest, &c. Makes its nest generally in banks, and makes slaves of *F. fusca* and *cunicularia*. The ♂ and ♀ appear about July.

4. *exsecta*, Nyl. Act. Soc. Fenn. 1846, 2, p. 909, Fig. Entom. Ann. 1865, frontisp. fig. 2.

Similar in colour to *rufa* (see No. 1), but very distinct in form; the wide emargination of the head at the back, the smaller eyes placed farther from the posterior margin, and the sides of the head behind the eyes converging to the posterior margin, easily distinguish it in all the sexes, besides the narrow, almost straight-sided and deeply-notched scale of the petiole, and the smaller size of the ♂ and ♀. Length 7—8 mill.

Hab.—Bournemouth.

The ♂ and ♀ appear in July. This species forms a nest, heaped up after the style of that of *rufa* and *congerens*, but much smaller in diameter, and frequently on the open heath.

5. *cunicularia*, Ltr. Hist. Nat. Fourm. p. 151.

Very like *rufa* in colouring; ♂ differs in being smaller, with clearer wings, in having the thorax without semi-erect hairs, and the frontal area dull; the legs clear testaceous. Length $3\frac{1}{2}$ lines.

♀ differs in having the metathorax generally brown, the abdomen dull, the legs clear testaceous, and the frontal area dull. Length 9 mill.

♂ like a small elongate *rufa*, and sometimes even brighter in colour, but generally more obscure. It may always be distinguished from that species by the dull frontal area, and from *sanguinea* by the entire clypeus. Length 7—8 mill.

Hab.—Generally distributed and common in many localities. Makes its nest in the ground; ♂ and ♀ appear about August.

6. *fusca*, Linn. Syst. Nat. ed. x. 1, p. 580. Fig. Latr. Hist. Nat. Fourm. pl. vi. fig. 32.

♂ dark black-brown, shining, with a somewhat bronzy tint. Scape of the antennæ of the same colour as the head; frontal area dull, legs and genital segments testaceous-red. Length 8 mill.

♀ dark brown, polished, with a bronzy tint, only the legs and scape of the antennæ dull brownish red; head and thorax with a few erect hairs. Abdomen remotely and very shallowly punctured, bearing a few scattered bristly hairs. Length 8 mill.

§ dark brown, with a bronzy tint, covered with an exceedingly fine sericeous pubescence, which gives it a sheeny appearance; legs and antennæ slightly paler. Abdomen with a few short, pale, bristly hairs near the apex of each segment. Length 5—8 mill.

Hab.—Very common; makes its nest in the ground.

Very closely allied to *cunicularia*, and I have little doubt that Emery and Forel are right in considering them as merely races of the same species; there seems to be no structural character to distinguish one from the other, and their habits are very similar; still they generally differ considerably in colour, but occasionally a § is found which it would be almost impossible to refer to one or the other with any certainty.

7. *gagates*, Ltr. Essai Fourm. France, p. 36.

I have a single § which belongs to this form. Its bright shining, glabrous body, scattered over with brownish bristly hairs, separates it from *fusca*.

Length 7 mill.

Hab.—Bournemouth.

Smith gives this as a new species to England in Ent. Annual for 1866, but has omitted it from his Catalogue. Emery and Forel consider it as another race of *fusca*.

LASIUS, *Fab.*

Syst. Piez. p. 415.

Formica pars, Smith.

Differs from *Formica* in having the ♂ much smaller than the ♀, and in the shape of the antennæ (see table of genera, *antea*).

- (2) 1. Deep black; ♀ and ♂ very shining *fuliginosa*.
 (1) 2. Brownish; ♀ and ♂ not very shining.
 (6) 3. Tibiæ with erect prominent hairs.
 (5) 4. ♂ with the mandibles with one tooth, wings clear;
 ♀ head not so wide as thorax, wings clear; ♂
 dark brown *niger*.
 (4) 5. ♂ with the mandibles 5-toothed, wings dusky at
 the base; ♀ head wider than the thorax,
 wings dusky at the base; ♂ pale yellow .. *umbratus*.
 (3) 6. Tibiæ without prominent hairs.
 (8) 7. ♂ and ♀ with the wings more or less clouded; ♂
 forehead not channelled; ♂ pale yellow .. *flavus*.
 (7) 8. ♂ and ♀ wings quite clear; ♂ forehead chan-
 nelled; ♂ brown *alienus*.

1. *fuliginosus*, Ltr. Ess. Fourm. France, p. 36. Fig.
 Hist. Nat. Fourm. pl. v. fig. 27.

Jet-black, shining; head widely excavated behind.

♂ about the same size as the ♀; thorax and abdomen with a few scattered hairs; flagellum of antennæ and the tarsi testaceous; wings dusky at the base. Length 4—5 mill.

♀ and ♂ like the ♂, but rather more shining; the segments of the abdomen above with an apical fringe of fine short hairs, set at some distance from each other; extreme apex of the body, tarsi, and sometimes tibiæ, more or less testaceous. Length, ♀ 6 mill., ♂ 3—5 mill.

Hab.—Generally distributed; in old trees, &c. Very distinct from any other species. ♂ and ♀ are found in June and July.

2. *niger*, Linn. Syst. Nat. ed. x. 1, p. 580.

♂ fuscous, legs and flagellum of antennæ rather paler, entire insect covered with a fine, adpressed, grey pubescence, and with scattered, fine, erect hairs; head slightly narrower than the thorax, deeply sulcate in front; mesothorax, looked at sideways, much raised and rounded in front, flat on the disk; wings hyaline; scutellum large, somewhat raised, and nearly square; scale of the petiole somewhat truncate above, and largely, but very slightly, emarginate; abdomen somewhat egg-shaped; scape of the antennæ and tibiæ with fine erect hairs. Length 3—5 mill.

♂ much larger than the ♀, similar in colour, but with the mandibles, legs, and scape of antennæ pale testaceous-brown; head much narrower than the thorax;

wings large and hyaline, their nervures pale; abdomen very large and oval, densely covered with a fine silky pubescence, and with short, semi-erect, brownish hairs; scape of the antennæ and tibiæ with fine erect hairs. Length 8—10 mill.

♂ generally rather smaller than the ♂, and like like the ♀ in colour and pubescence, but the head larger and much wider than the thorax; abdomen only slightly larger than the head; scape of the antennæ and tibiæ with fine erect hairs; extreme apex of the antennæ pale in all the sexes. Length 2—5 mill.

Hab.—Very abundant everywhere.

3. *alienus*, Först. Hym. Stud. i. Heft p. 36.

Differing only from the preceding in having the scape of the antennæ and tibiæ without the erect hairs, and being generally rather paler and smaller; ♀ with the costal area infusate.

Hab.—Not nearly so common as *niger*, but widely distributed. I have taken it at Chobham, Hayling Island, &c.

4. *umbratus*, Nyl. Add. Adn. Form. Bor. Eur. p. 1048.
= *brunnea*, Sm. Cat. Brit. Hym. p. 2.

The ♂ of this species is easily distinguished from either of the above by the much wider head, which is wider than the thorax, by the mandibles being armed with five teeth, and by the dark smoky base to the wings. The flagellum of the antennæ and the tibiæ and tarsi are also paler. Length 3—5 mill.

The ♀ differs from the allied species in its brighter brown, almost mahogany, colour, the large head, which is wider than the thorax, the much smaller abdomen, and the light clear brown antennæ and legs. Length 7 mill.

The ♂ is of a pale yellow colour, and therefore can only be confounded with *L. flavus*, from which the erect hairs of the tibiæ and the denser hairiness of the body generally distinguish it. Length 2—5 mill.

Hab.—Generally distributed, and not uncommon. It occurs in the London district, and I have taken it at Chobham, Hayling Island, &c.

5. *flavus*, DeGeer. Ins. ii. 1089, 5, pl. xlii. f. 24—28.

♂ differs from the preceding by the narrow head and the untoothed mandibles, and the tibiæ without erect hairs; from *niger* and *alienus* it differs in having no distinct frontal channel, and the wings generally slightly clouded at the base.

♀ differs from *umbratus* in the smaller head, paler colour, and smaller size, and the want of erect hairs on the tibiæ; from *niger* and *alienus* in the dusky base to the wings, the brown colour extending to nearly their middle.

♀ pale yellow, like *umbratus*, but generally smaller, and distinguished by the want of the erect hairs on the tibiæ and scape of the antennæ.

Hab.—Common everywhere.

TAPINOMA, *Foerst.* (Pl. VII. fig. 3).

Hym. Stud. 1 Heft, p. 43.

Differs from either of the preceding genera in wanting the upright scale to the petiole, which is represented by a flattened, somewhat oblong, node.

- (2) 1. Black or brown-black *erratica*.
 (1) 2. Rufo-testaceous; ♀ only known *polita*.

1. *erratica*, Latr. Essai Fourm. France, p. 24.

At first sight like a very dark *Lasius niger*, but at once distinguishable by the want of the upright scale to the petiole.

♂ dark black-brown; eyes situated about midway between the base of the head and the apex of the mandibles, vertex square, clypeus deeply emarginate; antennæ very long, three-quarters as long as the body, joints of the flagellum subequal; thorax rounded in front, disk flat; wings hyaline, nervures pale; abdomen with a few scattered bristly hairs above, all the segments with a fringe of hairs beneath; genitalia very large, of the same colour as the rest of the body; tibiæ and tarsi pale, the former clouded in the middle. Length 5—6 mill.

♀ brown-black, with similar pubescence to that of the ♂; abdomen wider than in the male. Length 5—6 mill.

♀ jet-black, covered with very fine adpressed grey hairs; the extreme base of the tibiæ and tarsi

paler. Very like *L. niger* in shape, but eyes much farther from the base of the head; clypeus deeply emarginate; mandibles with long hairs on their surface; no upright scale to the petiole; surface of the body above without upright hairs; abdomen beneath with long fine hairs on each segment. Length, 3—5 mill.

Hab.—Common only in certain localities, and it seems to confine itself to sandy and dry heathy country. It has occurred at Bournemouth, Chobham, Weybridge, Guildford, Coombe Wood; also near Croydon, and in Scotland.

2. *nitens*, Mayr. Verh. Zool. Bot. Wien. ii. p. 143.
= *polita*, Smith, *fide* Emery and Forel.

“♀ rufo-testaceous, smooth and shining; head elongate, with a few scattered long hairs, and slightly emarginate behind; the scape as long as the head; the flagellum about the same length, the two apical joints slightly thickened; thorax narrowed behind, and slightly strangulated between the meso- and metathorax, the latter emarginate behind, with the lateral angles rounded; scale decumbent, rounded above; abdomen ovate, sprinkled with a few long hairs.”

Length 4 mill. ♂ only known.

I have never seen Smith's *polita*, so copy the description from his book.

Hab.—Wales; one specimen. J. C. Dale, Esq.

PONERIDÆ.

PONERA, Latr. (Pl. VII. fig. 4).

Hist. Nat. Crust. et Ins.

This genus is easily recognised by its elongate parallel-sided shape, and the thick large scale of the petiole, as well as by its short clavate antennæ, which hardly reach to the apex of the metathorax in the ♀, and the constricted 1st segment of the abdomen; maxillary palpi 1- or 2-jointed, labial palpi 2-jointed; wings with one radial cell, two submarginals, and one discoidal.

- (2) 1. Paler, puncturation distinct, especially on the head;
maxillary palpi 2-jointed, the 2nd terminating
in a hair *contracta*.
- (1) 2. Darker, puncturation so fine as to be hardly distinguishable even under a somewhat strong lens;
maxillary palpi with only a single joint *punctatissima*.

1. *contracta*, Latr. Hist. Nat. Fourm. p. 195, pl. vii. fig. 40.

♂ brown, somewhat shining; head dull, strongly punctured; mandibles testaceous-red; thorax shining, rather remotely punctured; abdomen covered with somewhat decumbent pale hairs; apex of the abdomen paler, with a strong reflexed spine; legs testaceous.

♀ and ♂ of a paler colour, but with the same strong punctuation; the maxillary palpi of two joints, the second ending in a hair; abdomen covered with pale hairs; eyes obsolete in the ♂; wings of the ♀ as in the ♂.

Length 3—4 mill.

Hab.—Rare. Brighton; Merton, Dr. Power; Weybridge, Mr. Billups. I have never taken it myself.

2. *punctatissima*, Rog. Berl. Zeitsch. 1859, p. 246, pl. vii. fig. 7 (palpi). = *tarda*, Sm.

Very like the above, but darker; the punctuation of the head is much finer, so fine indeed as to be hardly discernible, and the pubescence of the abdomen adpressed, not mixed with semi-prominent hairs, as in *contracta*; maxillary palpi 1-jointed.

Length 3—4 mill.

Hab.—Occasionally in houses; native?

MYRMICIDÆ.

- (12) 1. Wings not very dark, or if dark not longly ciliated at the edges in ♂; 1st node of petiole much widened behind ♀ and ♂.
- (11) 2. Metathorax spined in ♀ and ♂; mesothorax with two impressed lines converging behind in the ♂
- (4) 3. Last 3 joints of flagellum not nearly so long as its remainder in ♀ and ♂; apical nerve of submarginal cell in ♂ and ♀ divided in two by a transverse nervure *Myrmica*.
- (3) 4. Last 3 joints of flagellum as long or nearly as long as its remainder in ♀ and ♂; apical nerve of submarginal cell in ♂ not divided by a transverse nervure.
- (6) 5. 2nd node of petiole in ♀ and ♂ spined beneath; ♂ with clypeus keeled *Stenamma*.
- (5) 6. 2nd node in ♀ and ♂ simple; clypeus of ♂ not keeled.
- (10) 7. Hairs of thorax simple in ♀ and ♂; antennæ 10- or 13-jointed in ♂; if 13-jointed, then with 1st joint of petiole very long.
- (9) 8. Eyes very small, and head reticulated behind in ♀ and ♂; ♂ antennæ 13-jointed *Asemorhoptrum*.
- (8) 9. Eyes not very small, and head longitudinally striate behind; ♂ antennæ 10-jointed *Tetramorium*.

- (7) 10. Hairs of thorax clubbed in ♀ and ♂; antennæ 12- or 13-jointed in ♂; 1st joint of petiole not elongate *Leptothorax*.
 (2) 11. Metathorax not spined in ♀ and ♂; mesothorax in ♂ without converging lines *Solenopsis*.
 (1) 12. Wings very dark and ciliated in ♂; 1st node of petiole square in ♂ and ♀ *Myrmecina*.

MYRMICA. (Pl. VII. figs. 5 and 6).

Latreille, Gen. Crust. et Ins. iv. p. 131.

The five forms that I have described of this genus bear a very close general resemblance to one another, and the latest authorities, Messrs. Emery and Forel, consider them as mere races of one species. I have no doubt they are right; but as a rule they are pretty easily distinguishable, and I have therefore thought better to keep them distinct.

The short apical joints to the flagellum, the last three of which are not nearly so long as its remaining joints in the ♀ and ♂, and the transverse nervure which divides the submarginal cell in the ♂ and ♀, distinguish this genus from its allies. Labial palpi 4-jointed; maxillary palpi 6-jointed.

- (6) 1. ♂ with the basal joint of the antennæ half as long as the flagellum, and also gradually curved near the base; ♀ and ♂ with the basal joint not somewhat angularly and sharply bent near the base.
 (3) 2. Frontal area longitudinally striated in all the sexes *sulcinodis*.
 (2) 3. Frontal area smooth and shining in all the sexes.
 (5) 4. ♂ with long erect hairs on the tibiæ; ♀ with the metathoracic spines not longer than they are wide at the base; ♂ with the spines scarcely longer than in the ♀ and the space between them smooth and shining *levinodis*.
 (4) 5. ♂ with short, somewhat adpressed hairs on the tibiæ; ♀ with metathoracic spines much longer than their basal width; ♂ with long spines like the ♀ and with the space between them rugose *ruginodis*.
 (1) 6. ♂ with the basal joint of the antennæ not $\frac{1}{4}$ so long as the flagellum, or, if half as long as the flagellum, then with it sharply bent near the base; ♀ and ♂ with the basal joint sharply and angularly bent near the base.
 (8) 7. ♂ basal joint of antennæ very short, not longer than the first two or three joints of the flagellum; ♀ and ♂ with the basal joint not spinose at its bend *scabrinodis*.
 (7) 8. ♂ basal joint of antennæ half as long as the flagellum: sharply bent at the base; ♀ and ♂ with the angle of the basal joint spinosely lobate .. *lobicornis*.

1. *ruginodis*, Nyl. Adn. Mon. Form. Bor. Eur. p. 929, 2.

♂ dark brown, shining, surface with scattered, short, semi-erect hairs; mesothorax in front, metathorax, and abdomen polished and shining; wings dusky at the base, the dusky colour extending as far as the radial cell; head, across the eyes, wider than the thorax, eyes very prominent, situated about midway between the base of the head and the apex of the mandibles, frontal area not sulcate, vertex somewhat longitudinally rugose; antennæ with the scape curved towards the base, and thickened towards the apex, as long as the first six joints of the flagellum; mesothorax in front of the converging lines very shining and polished, behind them slightly uneven, with indications of longitudinal rugosities; metathorax with two very blunt spines, both nodes of the petiole smooth and shining; abdomen about the same width as the thorax, egg-shaped; legs with fine short semi-adpressed hairs. Length 6 mill.

♀ testaceous, covered with long pale hairs; head, with the exception of the mandibles, abdomen except at the apex, and a curved line running from the insertion of the wings, round the scutellum, generally darker; wings more or less testaceous towards the base, nerves pale; head and thorax deeply and longitudinally rugose, the latter rather smoother on the disk; head wider than the thorax, frontal area smooth and shining, scape of the antennæ slightly and regularly curved at the base; mesothorax rounded in front, moderately convex on the disk, as wide behind as in front; metathorax with two strong, slightly curved spines, which are longer than they are wide at the base, space between them transversely rugose; nodes of the petiole rugose; abdomen shortly oval, with a darker cloud towards the base; legs covered with short, somewhat adpressed hairs. Length 6—7 mill.

♂ differs from the ♀ in the shape of the thorax, which is wider in front than behind, and constricted near the middle; it is also generally much more rugose, with the rugosities deep and longitudinal. The metathorax is as high as the mesothorax, and the spines project above its level. Length 5—6 mill.

A common species in most localities.

2. *levinodis*, Nyl. Adn. Mon. Form. Bor. Eur. p. 927.

Extremely like the above, but differs in the male by being smaller, with the antennæ much shorter, and the scape slightly shorter in comparison with the flagellum, and the legs covered with long erect hairs.

In the ♀ by the metathoracic spines being much shorter and wider, each spine being wider at the base than it is long, and quite straight, the space between the spines being smooth and shining, not transversely rugose as in the preceding; the nodes of the petiole also are rather smoother. In the ♂ much as in the ♀, but having, besides, the thorax less deeply rugose, and the rugosities not longitudinal.

Also a common species, but less generally distributed than the preceding.

3. *sulcinodis*, Nyl. Adn. Mon. Form. Bor. Eur. p. 931.

♂ differs from either of the preceding in being darker (nearly black); head not shining, with the frontal area longitudinally sulcate; mesothorax in front dull, more or less transversely wrinkled, rather deeply and longitudinally rugose behind the converging lines; scutellum and base of the metathorax also rugose; first node of the petiole dull and more or less rugose, second polished and shining; abdomen and legs much as in the preceding. Length 6 mill.

♀ and ♂ may be known by their darker, redder brown colour, the head more deeply rugose, and reticulated behind the eyes at the sides, the scape of the antennæ curved suddenly near the base, the frontal area sulcate, the thorax and nodes of the petiole deeply, longitudinally, and rugosely sulcate. Length 6—7 mill.

Hab.—Rare. Wales, Hampshire, Chobham.

4. *scabrinodis*, Nyl. Adn. Mon. Form. Bor. Eur. p. 930.

♂ at once known from any of the preceding by the short scape of the antennæ, which is not longer than the first two or three joints of the flagellum, and by having the legs very densely covered with long erect hairs.

♀ and ♂ very like *sulcinodis*, but with the scape of the antennæ thicker and rather shorter, distinctly geniculated near the base; it also appears to be flattened at the turn: this appearance is given by a sort

of angular dilatation on its upper side. The thorax and the nodes of the petiole are less rugose. The colour of the insect is testaceous, as in *uginodis* and *lævinodis*, from which the geniculated scape distinguish it at once. Wings in the ♀ dusky to beyond the submarginal cell.

Hab.—Very abundant almost everywhere.

5. *lobicornis*, Nyl. Adn. Mon. Form. Bor. Eur. p. 932, fig. Smith Brit. Foss. Hym. pl. i. fig. 12 (antenna).

Like the other species of the genus in general appearance.

♂ differs from *scabrinodis* in the long scape of the antennæ, which is half as long as the flagellum, and from the other species in the scape being angularly bent at the base.

♀ and ♂ are of the same dark colour as *sulcinodis*, but have the scape of the antennæ geniculated as in *scabrinodis*, but not flattened at the bend, the bend bearing a distinct spine.

Hab.—Rare. Chobham, South Shields, Whitley, Scotland, &c.

STENAMMA, *Westw.* (Pl. VII. fig. 7).

Intr. Class. Ins. vol. ii. p. 226.

This genus may be known from *Myrmica* by having only three joints to the labial palpi and four to the maxillary, and by the ♂ and ♀ only having eleven joints to the antennæ. The smooth polished surface of the head and thorax and the spine under the second node of the petiole in the ♀ and ♂, as well as the keeled clypeus of the ♂, will distinguish it from all its allies.

1. *Westwoodii*, Westw. Intr. Class. Ins. ii. p. 226, pl. lxxxvi. fig. 11.

♂ brownish black; antennæ, mandibles, sides of prothorax, and legs pale, slightly hairy; head and thorax dull, and very finely rugose; clypeus with a central keel; abdomen smooth and shining; wings milky white; anterior wings with the marginal cell incomplete, and with one submarginal and one discoidal cell. Length 5 mill.

♀ and ♂ testaceous, smooth, polished, and shining, with short scattered hairs; antennæ rather densely

clothed with short hairs, basal joint of the flagellum as long as the next three together; metathorax with two rather short, triangular spines, second node of the petiole beneath produced in front into a strong spine; abdomen more or less brown across the middle; wings of ♀ as in ♂, but clearer. Length, ♀ 5 mill., ♂ 3—4 mill.

Hab.—Nests of *Formica rufa*. Weybridge, Guildford, &c.

ASEMORHOPTRUM, Mayr.

Europ. Form. (Nachtrag.), after p. 75.

This genus is very closely allied in general appearance to the following, but the ♂ may be known at once by its 13-jointed antennæ; the ♀ and ♂ by their small eyes and 8- to 9-toothed mandibles.

1. *lippula*, Nyl. Add. Alt. Form. Bor. p. 41. Fig. Smith, Brit. Foss. Hym. pl. i. fig. 18.

♂ brown, the antennæ and legs paler, sparsely clothed with long fine pale hairs; head finely and longitudinally rugose; scape of the antennæ as long as the first three joints of the flagellum; wings ciliated, somewhat opaque, nervures very pale; metathorax nearly smooth, with a tooth on each side at the apex; abdomen smooth and shining; first joint of the petiole very long; apex of the abdomen densely covered with somewhat curled whitish hairs. Length 4 mill.

♀ and ♂ reddish brown, mandibles, antennæ, and legs rather paler; head rather elongate and narrow, finely reticulated; thorax irregularly, longitudinally rugose; metathorax with two short spines; first joint of the petiole elongate, with a rather small apical node, second node of the petiole nearly round, a little longer than wide, first segment of abdomen beyond the petiole, very long, at least three times as long as the remainder.

Length, ♀ 5—6 mill., ♂ 3 mill.

Hab.—Rare. Plymouth, London district, Chobham, Tunbridge Wells, Norwich, &c.

TETRAMORIUM, Mayr.

Form. Austr. p. 151.

Differs from *Myrmica*, &c., as shown in the table of genera.

Antennæ 10-jointed in the ♂ 12-jointed in ♀ and ♂ ; labial palpi 3-jointed ; maxillary palpi 6-jointed ; front wings with one marginal, one submarginal, and one discoidal cell ; metathorax with two spines in the ♀ and ♂ ; merely truncate and angulated in the ♂ ; ♀ nearly twice the size of the ♂ , and considerably larger than the ♂ .

1. *cæspitum*, Linn. Syst. Ent. ed. x. vol. i. p. 581.

♂ brown-black, shining ; head much narrower than thorax ; antennæ and legs paler ; head finely and longitudinally rugose on the vertex ; thorax shining, clothed with scattered hairs ; nodes of the petiole short, the second widely transverse, both more or less hairy above ; abdomen polished and shining, with a few scattered pale hairs ; wings milky white, nervures pale. Length 6—7 mill.

♀ larger than the ♂ ; head as wide as thorax, or nearly so ; mesothorax irregularly punctured ; apex of the metathorax emarginate and spined at each side ; abdomen oval, shining and polished, with pale scattered hairs ; wings as in the ♂ . Length 7—8 mill.

♂ dark brown ; thorax, sides of head, antennæ, mandibles, and legs somewhat paler. Head large and quadrate, decidedly wider than the thorax, longitudinally striate ; thorax longitudinally striate, much widest in front ; metathorax with two sharp spines. Nodes of the petiole much elevated, smooth ; first, looked at sideways, almost as high as long ; looked at from above, not quite so wide as long ; second, looked at sideways, nearly round ; looked at from above, transverse. Abdomen shining and polished. Entire insect clothed with scattered long hairs. Length 2—4 mill.

Hab.—Sandy localities ; often very abundant.

LEPTOTHORAX, *Mayr.*

Form. Austr. p. 159.

This genus consists of three species only in England, which have the peculiarity of having their hairs clavate in the ♀ and ♂ , a character easily seen with a strong lens. The ♀ is small, scarcely larger than the ♂ ; the ♂ is also small, with 11- or 13-jointed antennæ ; the frontal area not clearly defined. Labial palpi 3-jointed ; maxillary palpi 5-jointed.

- (2) 1. ♂ antennæ 12-jointed; ♀ and ♀ 11-jointed .. *acerrorum*.
 (1) 2. ♂ antennæ 13-jointed; ♀ and ♀ 12-jointed.
 (4) 3. ♂ thorax in front of the converging lines very
 finely rugose; club of the antennæ in ♀ and ♂
 dark *unifasciatus*.
 (3) 4. ♂ thorax in front of the converging lines smooth
 and polished; club of the antennæ in ♀ and ♂
 pale *Nylanderi*.

1. *acerrorum*, Fab. Ent. Syst. ii. p. 358.

♂ black; mandibles and legs brown, joints and tarsi paler; clothed with long whitish hairs, especially on the dull, rugose head; mandibles not toothed; antennæ 12-jointed, scape very short and thick, about as long as the second joint of the flagellum, which is much longer than the first; thorax irregularly rugose posteriorly; metathorax tuberculated at the sides behind; nodes of the petiole smooth and shining; abdomen shining and smooth; wings very thin, milky white. Length 5 mill.

♀ brownish red; head, thorax, and abdomen above, nearly black; mandibles, scape, and legs paler; antennæ 11-jointed, head finely and longitudinally rugose; thorax and nodes of the petiole also rugose; metathorax with two stout, rather blunt spines; abdomen shining, with scattered white hairs; legs with prominent hairs. Length 4—5 mill.

♂ testaceous-red; head, apex of antennæ, and abdomen nearly black; thorax sometimes with a more or less extended dark patch on the disc. Entire insect clothed with scattered short, upright, pale hairs; head and thorax rugose; antennæ 12-jointed; metathorax with two short, rather blunt spines; first joint of the petiole nearly quadrangular looked at from above, from a side view much raised posteriorly; both joints more or less rugose; abdomen smooth and shining. Length 4 mill.

Hab.—Under bark, &c.; chiefly a northern species. I have taken it, however, near Croydon, and it occurs, I believe, in other localities near London.

2. *Nylanderi*, Foerst. Hym. Stud. Form. p. 53.

♂ brown; the mandibles, antennæ, and legs pale; mandibles 4- or 5-toothed; scape of the antennæ as long as the first three or four joints of the flagellum; the first seven joints of the flagellum are of about equal

lengths, the following four are thicker and longer, and the apical joint is almost longer than the two preceding together; thorax in front of the converging lines smooth and shining, behind finely and longitudinally rugose; metathorax finely rugose, and with two small tubercles; abdomen shining, the nodes of the petiole smooth above. Length 2 mill.

♀ testaceous, club of the antennæ of the same colour; abdomen black-brown, with the base of the first segment widely, and of the following more or less narrowly, testaceous. Head and thorax longitudinally striate, clothed with scattered club-shaped hairs; thorax as wide as the head; wings slightly milky, nervures very pale; metathorax with two sharp spines, very wide at the base; abdomen shining, clothed with scattered hairs. Length 5 mill.

♂ differs from the ♀ only in having the thorax much narrower than the head and constricted in the middle, its surface rather more rugosely striate, and the spines of the metathorax rather longer, and in being smaller in size. Length 2 mill.

Hab.—Not common. I have taken it by sweeping at Chobham and at Wimbledon, but only in solitary specimens. I have compiled the description of the ♂ from Mayr's 'Formicina Austriaca.'

3. *unifasciata*, Ltr. Ess. l'Hist. Nat. Fourm. Fr. p. 47.

Very like the preceding, of which Messrs. Forel and Emery consider it a race, putting them both together under the name *tuberum*, Nyl.

The ♂ may be known from that sex of *Nylanderi* by having the thorax in front of the converging lines rugose; the ♀ and ♂ by having the apex of the antennæ dark dark brown, and the black bands of the body narrower, often wanting, except on the basal segments.

Hab.—Rare. Sherborne, Dorset, C. W. Dale; and Ventnor, Isle of Wight, taken by myself.

SOLENOPSIS, *West.*

Ann. Mag. Nat. Hist. 1840, t. vi. p. 86.

Diplorhoptrum pars, Smith.

This genus may be easily known from any other British one of this group. The ♂ has the mesothorax without

the impressed converging lines observable in all the others, and the ♀ and ♂ have the metathorax without spines or teeth; the species are very small, the ♂ a good deal smaller than the ♀ and ♂. Labial palpi 2-jointed, maxillary palpi 2-jointed; ♂ antennæ 12-jointed, ♀ and ♂ 10-jointed, club 2-jointed; front wings with one marginal, one submarginal, and one discoidal cell.

1. *fugax*, Ltr. Ess. l'Hist. Fourm. Fr. p. 46. Fig. Smith Brit. Foss. Hym. pl. i. fig. 15, 16.

♂ black, shining; mandibles, antennæ, and legs brown; tarsi and inner margins of the mandibles testaceous. Entire insect covered with long pale hairs; mandibles with three teeth; scape of the antennæ short, about as long as the second joint of the flagellum, but thicker; the three apical joints are longer than the others. Head and thorax finely rugose; abdomen shining, nodes of the petiole finely rugose; wings hyaline, nervures pale. Length 5 mill.

♀ brown-black, shining; mandibles, antennæ, and legs paler. Entire insect hairy, like the ♂; mandibles with four teeth; scape of the antennæ reaching to the eye; the first joint of the flagellum is twice as long as wide, the seven following, shorter than wide, the ninth and tenth forming a decided club. Head and thorax punctured; abdomen shining and punctured, nodes of the petiole somewhat rugose; wings as in the ♂. Length 6 mill.

♂ pale yellow, shining, covered with long pale hairs; clypeus bidentate; mandibles with four teeth; scape of the antennæ not quite so long as the flagellum, but reaching almost to the middle of the apical joint; apical joint almost as long as all the other joints of the flagellum together, apical and penultimate joints forming the club. Head and thorax with scattered punctures; metathorax rounded, without spines; abdomen with scattered punctures; first joint of the petiole very wide behind and rounded, second slightly transverse; legs hairy. Length 2 mill.

Hab.—Southend and Deal, F. Smith.

The habits of this little species, according to Forel (Mitth. Schw. Entom. Gesellsch. vol. iii. No. 3, 1869), are most interesting. It appears often or generally to live

in the walls of the nests of other ants, so that the two species do not intermix, and, although living in such close proximity to one another, are bitter enemies, and fight ferociously if they meet. The channels cut out by *S. fugax* are so fine that they will only just admit the insect. The long account given by Forel, quoted above, is well worth reading.

MONOMORIUM PHARAONIS, *Linn.* Syst. Nat. ed. x. Vol. i. p. 580. = *Diplorhoptrum domesticum*, Sm.

This genus and species can hardly be included amongst our indigenous Hymenoptera, yet it is unfortunately so common now in many houses that I cannot leave it out.

It belongs to the same division as *Solenopsis fugax*, the ♂ having no converging lines on the mesothorax, and the ♀ and ♂ no spines on the metathorax. Its elongate form and almost naked surface at once distinguish it from *fugax*, as well as the short terminal joint to the antennæ, which is not more than half as long as the rest of the flagellum. The ♂ also has 13-jointed antennæ, and the ♀ and ♂ 12; the club composed of three joints.

Common in some houses in London, Hastings, &c.

"A native of tropical and subtropical countries throughout the entire world, living in houses."—Forel and Emery.

MYRMECINA, *Curt.* (Pl. VII. fig. 8.)

Brit. Ent. vol. vi. fol. 226.

♂ antennæ 13-jointed, ♀ and ♂ 12-jointed; maxillary palpi 4-jointed, labial palpi 3-jointed; mandibles small in the ♂, with three teeth; those of the ♀ and ♂ with two strong teeth, and seven indistinct small ones; wings very dark and hairy, and margins ciliated, with an appendiculated marginal cell and one submarginal; metathorax spined in all the sexes, but very shortly so in the ♂; first node of the petiole nearly square in all the sexes, second somewhat rounded in front, truncate behind.

1. *Latreillei*, *Curt.* Brit. Ent. vi. fig. 265 ♂. Smith Brit. Foss. Hym. pl. i. fig. 19, ♀.

♂ black-brown, covered with rather long hairs; antennæ and legs somewhat paler. Head with the vertex

much rounded and elevated, the ocelli very prominent; antennæ with the scape very short, about as long as the two following joints; mesothorax irregularly punctured and somewhat rugose behind, converging lines very deep and crenate; metathorax crenate at the base, apex with two short spines; wings as in the description of the genus; abdomen shining and polished; nodes of the petiole irregularly rugose; legs finely pilose. Length 4 mill.

♀ rather larger than the ♂, black-brown, with the clypeus, mandibles, antennæ, legs, and the under side of the thorax and nodes of the petiole reddish testaceous. Head rugose, somewhat clathrately so at the sides; scape of the antennæ thick, and about as long as the nine following joints of flagellum; mesothorax smooth in front, longitudinally rugose behind; metathorax with two horizontal spines; abdomen shining, finely pilose, nodes of the petiole rugose, basal node nearly quadrangular; legs finely pilose. Length 4 mill.

♂ like the ♀ but smaller, and with thorax more rugose. Length 3 mill.

Hab.—Rare. Isle of Wight; London district; Worthing.

The following species have been admitted into our lists, but they only occur in greenhouses, or other places where there can be little or no doubt that they have been introduced from abroad:—

Tetramorium guineense, F.=*Kollari*, Sm.—Greenhouses, Exeter, &c.

T. simillimum, Sm.—Kew, &c.

Pheidole megacephala, F.=*lævigata*, Sm.—Greenhouses, &c., Exeter, and house in the Borough.

FOSSORES.

Of this tribe we have thirty-six genera in England, varying very much in structure and in the neuration of the wings. They have all short tongues, and the ♀ has no pollen-collecting apparatus; the first joint of the posterior tarsi also is not wider than the others, as it is in nearly all the Melliferæ. Still, there are cases where it is not easy, at least for a beginner, to say whether the insect before him belongs to the Fossores

or the Melliferæ. In such cases I believe the structure of the hairs will prove an unfailing test, the plumose or branched hairs being a character of the Melliferæ only.

FOSSORES.

DIVISION I. — Prothorax considerably produced posteriorly, its hinder angles reaching to the tegulæ of the wings; ♀ sometimes apterous.

DIVISION II.—Prothorax often consisting of little more than a narrow collar, its posterior angles lobately produced, but in no case extending to the tegulæ; ♀ never apterous

DIVISION I.

- (4) 1. Eyes sometimes small, sometimes larger and reniform, not touching the base of the mandibles.
- (3) 2. Eyes not reniform; ♀ apterous *Mutillidæ*.
- (2) 3. Eyes reniform; ♀ winged *Sapygidæ*.
- (1) 4. Eyes large, touching the base of the mandibles.
- (6) 5. Intermediate tibiæ with one long spur; intermediate coxæ remote *Scoliidæ*.
- (5) 6. Intermediate tibiæ with two long spurs; intermediate coxæ contiguous *Pompilidæ*.

MUTILLIDÆ.

- (2) 1. Intermediate coxæ distant; ♀ without ocelli .. *Mutilla*.
- (1) 2. Intermediate coxæ contiguous; ♀ with ocelli.
- (4) 3. ♂ with four submarginal cells; ♀ rugose *Myrmosa*.
- (3) 4. ♂ with three submarginal cells; ♀ smooth and shining- *Methoca*.

MUTILLA, *Linn.* (Pl. VII. fig. 9).

Syst. Nat. ed. x. vol. i. p. 582.

This genus, with its strongly punctured and pubescent species, is not likely to be confounded with any but the genus immediately following, viz., *Myrmosa*, the ♀ of which, in general appearance, greatly resembles the ♀ of *Mutilla*; the presence of ocelli in the *Myrmosa* ♀ will, however, immediately distinguish them. In both our British species the abdomen is banded with pale golden or silvery hairs; the head is small and round, the eyes not reaching the base of the mandibles. Wings of the ♂ with three submarginal cells, the marginal cell short and somewhat semicircular; tegulæ very large; tibiæ of the ♀ denticulate; ♂ winged; ♀ apterous.

- (2) 1. Large, 12—15 mill. long; abdomen in the ♂ steel-blue, with silvery bands; basal segment in the ♀ without a dorsal spot *Europæa*.
 (1) 2. Small, 5—8 mill. long; abdomen in ♂ black, with silvery bands; basal segment in ♀ with a round dorsal spot *rufipes*.

1. *Europæa*, Linn. Syst. Nat. ed. x. vol. i. p. 583. Fig. Panz. Faun. Germ. 76—20 ♂, Donovan. Brit. Ins. pl. 212.

♂ head dark steel-blue, coarsely punctured; prothorax black; mesothorax red, deeply punctured, with the sides black; scutellum and post-scutellum red; metathorax rugose, black, sometimes with the base red; wings fuscous; abdomen hairy, steel-blue, deeply punctured, with a band of pale hairs on the 1st, 2nd, and 3rd segments, those of the 2nd and 3rd slightly interrupted.

♀ head black, rugosely punctured, covered with black hairs; thorax red, quadrangular, rugose; prothorax alone black, surface covered with bristly black hairs; abdomen black, deeply and rugosely punctured, clothed with long bristly black hairs; 1st, 2nd, and 3rd segments with an apical band of golden hairs, that of the 2nd and 3rd interrupted in the middle, that of the 3rd extending almost to the base of the segment; legs densely hairy; tibiæ spinose.

Length 12—15 mill.

Hab.—Sandy lanes, Kent; Darent and Birch Woods; Hampshire; &c. Often found in the nests of the species of *Bombus*.

2. *rufipes*, Latr. Act. Soc. Hist. Nat. i. p. 9 (1792) = *ephippium*, Fab. Ent. Syst. ii. p. 370, ♂ (1793). Fig. Curtis Brit. Ent. ii. pl. lxxvii.

Largely and deeply punctured, covered with long projecting hairs.

♂ with the head black and very rugosely punctured, with a deep longitudinal incision on the vertex; prothorax, mesothorax, and scutellum red, the first black in its centre; wings slightly dusky; metathorax black, shining, largely and clathrately rugose; abdomen black, shining, largely punctured and clothed with silvery hairs, the 1st and 2nd segments with an apical band of silvery

hairs; beneath with the 1st and apical segments largely punctured, the others punctured only near the apex; legs black.

Female, head round, black, coarsely punctured; antennæ and mandibles rufo-ferruginous, the former dusky towards the apex; thorax red, rugosely punctured, clothed with a short adpressed silvery pubescence and scattered black, projecting hairs; abdomen black, punctured, clothed with black adpressed hairs and with long scattered projecting pale hairs, basal segment with a round spot on the disk and a band at the apex silvery, 2nd segment entirely covered with silvery hairs; legs red.

Length 5—8 mill.

Common in some localities. Weybridge, Southwold, Hayling Island, Plumstead Common, Charlton, near Greenwich, Deal, Southend, Sandown Bay, &c.

MYRMOSA, Latr. (Pl. VII. fig. 10).

Hist. Nat. xiii. p. 266.

There is only one British species in this genus, which is well characterised. ♂ entirely black; wings with four submarginal cells; segments of the abdomen slightly constricted at the base. ♀ much the same shape as that of *Mutilla*, but with distinct ocelli, and the intermediate coxæ contiguous. The surface in both sexes is rugosely punctured and hairy.

1. *melanocephala*, Fab. Ent. Syst. ii. p. 372, ♀. Fig. Latr. Gen. Crust. et Ins. iv. pl. xiii. figs. 6 and 8.

♂ black, rugose, covered with silvery grey hairs; head quadrangular on the vertex, face rounded, broader than long; prothorax truncate in front, mesothorax meeting it in a semicircular line; metathorax bounded at the sides by a slightly-raised line, and channelled in the middle at the base; wings slightly fuscous, with four submarginal cells; 2nd to 6th abdominal segments constricted and depressed at the apex, the depressed portion smooth and shining, 7th segment sulcate, bifid at the apex, 2nd segment beneath with a small spine at the base. Length 6—10 mill.

♀ apterous, covered with short pale hairs; head black, rugosely punctured; antennæ testaceous, dusky towards the apex; thorax testaceous-red, rugose, slightly

widest in front, sides almost straight; abdomen rugosely punctured, black, with the basal segment, and the base of the second, laterally testaceous-red, each segment at the apex testaceous, with a fringe of pale shining hairs and a few scattered longer hairs on the surface; legs testaceous-red. Length 5—7 mill.

Hab.—Not very common. Littlehampton, Weybridge, Chobham, Hastings, Hampshire, Isle of Wight, Lowestoft, Wakefield, &c. Male on flowers.

METHOCA, Latr. (Pl. VII. fig. 11).

Hist. Nat. xiii. p. 268.

♂ elongate, entirely black; antennæ long, reaching to the second segment of the abdomen; wings with three submarginal cells, the first very elongate, and with a slight indication of a divisional nerve on its lower margin, radial cell almost reaching to the apex of the wing; apex of the last ventral segment produced into a strong upcurved spine.

♀ black and red; head large and round; thorax much constricted in the middle; wings wanting; abdomen somewhat egg-shaped, acute at the apex, very shining.

The ♂ might easily be mistaken in the net for a good-sized ichneumon.

1. *ichneumonides*, Latr. Hist. Nat. xiii. p. 269, ♀. Fig. Lep. de St. Farg. Hym. pl. xxxvi. f. 2, ♂. Smith Brit. Foss. Hym. pl. ii. fig. 1 ♀.

♂ black, shining, covered with short greyish white hairs; head very hairy, strongly punctured, rounded posteriorly, clypeus elevated into a sort of angular spine; antennæ with the basal joint very thick, flagellum gradually tapering to the apex; thorax strongly punctured, the puncturation of the mesothorax, &c., denser than that of the prothorax; prothorax truncate in front, sides slightly curved, arcuately emarginate posteriorly; mesothorax sharply truncate posteriorly; scutellum very rugosely punctured, rounded posteriorly, and triangularly raised in the middle; metathorax rounded, gibbous, rugosely punctured; wings hyaline, with three submarginal cells, the third bounded by the apex of the wing; abdomen elongate, $1\frac{1}{2}$ times as long as the thorax,

shining, with irregular scattered punctures, the 1st four segments depressed and constricted at the apex, apical segment beneath bearing a strong upcurved spine; legs with short grey hairs. Length 12 mill.

♀ apterous, covered with scattered short hairs, shining; head, except the mandibles, and abdomen black; mandibles, thorax, legs, and antennæ testaceous-red; antennæ towards the apex, and front legs, more or less dusky; head nearly twice as wide as the thorax, rounded behind, and convex on the vertex, largely and remotely punctured; mandibles falcate, very pointed, with a single tooth on each before the apex, and with long white hairs on their surface; prothorax convex, much rounded at the sides, emarginate at the base, wider than the mesothorax; metathorax very globose; abdomen petiolated, elongate, ovate, impunctate, testaceous at the apex; tibiæ finely spinose; tarsi obscure at the apex. Length 6—9 mill.

Hab.—In sandy places. Weybridge; Chobham; Black Gang Chine and Sandown, Isle of Wight; Hampstead; Southend; Lyme Regis; Barnes Common; Dr. Power. ♂ very rare; I took one at Chobham in July, 1880, by sweeping in the evening after 8 p.m.

SAPYGIDÆ.

SAPYGA, *Latr.* (Pl. VII. fig. 12).

Prec. *Caract. gen. Ins.* p. 134.

Easily recognised by the long, somewhat clavate antennæ; the truncate thorax in front, and the smooth cylindrical abdomen, which is slightly widened towards the apex; wings with four submarginal cells.

- (2) 1. Antennæ of ♂ gradually thickened to the apex;
body in ♀ more or less red *5-punctata*.
(1) 2. Antennæ of ♂ with their two apical joints strongly
incrassate; ♀ without red on body *clavicornis*.

1. *5-punctata*, Fab. *Sp. Ins.* p. 453. Fig. Panz. *Faun.*
Germ. 100, 17, ♂.

Black, punctured; ♂ with the clypeus, two spots on the anterior margin of the prothorax, and a transverse spot on each side of the 2nd, 3rd, 4th, and sometimes 5th, abdominal segments, and a spot at the base of the posterior tibiæ white; antennæ beneath more or less

red. The number of spots on the abdomen is very variable.

♀ with a small white spot on each side of the prothorax, the abdomen having the 2nd and 3rd segments red, the 4th and 5th each with two lateral white spots, and the 6th with a white spot in the centre. Head and thorax dull, rugosely punctured, clothed with a fine short white pubescence; prothorax sharply truncate in front; wings slightly clouded; abdomen distinctly clavate in the ♂, somewhat oval in the ♀, with the apical segment sharply pointed; surface shining in the ♂, somewhat dull in the ♀, rugosely punctured in both sexes.

Length 9—12 mill.

Hab.—Common in many places. On palings, &c., Wandsworth and London district; Norwich, Yorkshire, Devonshire, Kent, Hants, &c.

2. *claricornis*, Linn. Syst. Nat. ed. x. vol. i. p. 574 (*Apis*). Fig. Smith Brit. Foss. Hym. pl. ii. fig. 6.

Very like the preceding, but differing in the shape of the antennæ of the ♂, which are longer, and have the two apical joints much thickened, forming a distinct club. The ♀ may be known at once by the colour of the abdomen, which wants the red band of *5-punctata*.

Hab.—Herefordshire, Nottingham, Birmingham, Wakefield, &c. I have never taken it myself.

SCOLIIDÆ.

TIPHIA, *Fab.* (Pl. VII. fig. 13).

Syst. Ent. p. 353.

May be known at once by the very elongate thorax, sharply truncate at the anterior margin of the prothorax and the posterior margin of the metathorax; the latter is elongate and nearly square, with three raised dorsal lines; wings with two submarginal cells; tibiæ and tarsi hairy and multispinose.

- (2) 1. Larger, radial cell incomplete in ♀; ♂ with the
1st segment of the abdomen transversely carina-
ted at the base *femorata*.
(1) 2. Smaller, radial cell complete in the ♀; ♂ with
the 1st abdominal segment not carinated at the
base *minuta*.

1. *femorata*, Fabr. Syst. Ent. p. 353. Fig. Panz. Faun. Germ. liii. 2.

Black, shining, clothed with scattered, white, shining hairs; posterior and intermediate femora and tibiæ in the ♀ red. Head rugosely punctured; prothorax slightly emarginate in front, its angles slightly produced, irregularly and remotely punctured anteriorly; mesothorax remotely punctured; wings slightly brownish in the ♀, hyaline in the ♂, ♀ with the radial cell incomplete; scutellum finely and remotely punctured, with a row of large punctures round its posterior margin; metathorax sharply truncate posteriorly, with three raised longitudinal lines down the middle, sides longitudinally strigose; abdomen punctured, 1st segment in the ♂ with a distinct, raised, transverse line at the base; tibiæ and tarsi hairy and spinose.

Length 8—12 mill.

Common in many localities. Birch Wood; Blackwater, Hants; Windsor; Southend; Deal; Lowestoft; Southwold; &c. Often on Umbelliferous flowers, especially *Daucus Carota*.

2. *minuta*, V. d. Lind. Nouv. Mem. Acad. Brux. iv. p. 182. Fig. Curtis Brit. Ent. xiv. p. 664.

Somewhat like the preceding, but much smaller; entirely black in both sexes, and not so shining; the wings with the stigma much larger, and the radial cell in both sexes complete; the ♂ without a raised transverse line at the base of the first abdominal segment.

Length 6—7 mill.

Hab.—Hampstead, Southgate, Cobey Hatch, Chobham, Bristol, Glanvilles-Wootton, Braunton Burrows, N. Devon, &c.

POMPILIDÆ.

- (4) 1. Front wings with two submarginal cells.
- (3) 2. Prothorax elongate; wings received in the middle of the sides of the thorax; mandibles 3-dentate *Aporus*.
- (2) 3. Prothorax transverse; wings received before the middle of the thorax; mandibles 2-dentate .. *Evagethes*.
- (1) 4. Three or four submarginal cells.
- (10) 5. Three submarginal cells.
- (7) 6. Vertex not punctured *Pompilus*.

- (6) 7. Vertex closely and rugosely punctured.
 (9) 8. ♂ body and legs entirely black; ♀ with the posterior tibiæ simple *Agenia*.
 (8) 9. ♂ abdomen red at the base, or with the legs more or less red; ♀ with the posterior tibiæ outwardly serrate *Priocnemis*.
 (5) 10. Four submarginal cells *Ceropales*.

Aporus, *Spin.* (Pl. VII. fig. 14.)

Ins. Lig. ii. p. 5.

A very distinct genus, differing from our other British Pompilidæ in the greater length of the prothorax, which in the ♀ is nearly as long as the mesothorax and scutellum together; it has also, like *Tragethes*, only two submarginal cells in the upper wings.

1. *unicolor*, *Spin.* Ins. Lig. ii. p. 33 = *bicolor*, *Sm.*
 Fig. *Smith Brit. Foss. Hym. pl. ii. fig. 11.*

♂ entirely black; ♀ with 1st, 2nd, and sometimes base of the 3rd segment of the abdomen red. Entire insect covered with a fine adpressed sericeous pile, changing colour in different lights; prothorax slightly and arcuately emarginate posteriorly, very long, as long as the mesothorax and scutellum together, in the ♀; wings fuscous in the ♀; legs with a few fine spines on the tibiæ.

Length 8—10 mill.

Hab.—Very rare. Southend, two ♀; Pakefield, near Lowestoft, one ♀.—F. Smith.

EVAGETHES. (Pl. VII. fig. 15.)

Differs only from *Pompilus* in having two submarginal cells.

1. *bicolor*, *Lep. Enc. Meth. x. p. 183* = *Aporus bicolor*, *Shuck.*

♂ black, covered with silvery sheeny pubescence, especially on the sides of the thorax, coxæ, and on the metathorax; 1st and 2nd segments of the abdomen generally more or less red; prothorax arcuately emarginate posteriorly, apical ventral segment of abdomen slightly carinated towards the base, 6th emarginate and slightly depressed in the middle, as well as the 5th.

♀ almost identical with *P. pectinipes*, and, but for the want of the 3rd submarginal cell, I believe undistinguishable from it.

Length 7—9 mill.

Hab.—Chobham, Bournemouth, Weybridge, &c.; rare. Often with *P. pectinipes*, and I feel it hard to believe that the two are more than forms of the same species.

POMPIUS, *Fabr.* (Pl. VII. fig. 16.)

Ent. Syst. Suppl. p. 246.

This genus, so closely allied to several of those that follow it, may be at once known by the impunctate surface of the vertex of the head. Although this character, which has been pointed out by Thomson, may seem to some to be scarcely of generic importance, still it affords a simple means of determining the genus, and distinguishes the ♂ from those of the allied genera, wherein the ♀ are otherwise very different; wings with three submarginal cells; posterior tibiæ of the ♀ not serrate.

- (8) 1. Abdomen entirely black, or black with white spots.
- (3) 2. Abdomen with white spots *rufipes*.
- (2) 3. Abdomen without white spots.
- (5) 4. Small, legs red in the ♀; posterior tibiæ in the ♂ with a pale spot at the base. Head with a small pale spot on the interior margins of the eyes .. *cinctellus*.
- (4) 5. Head and legs entirely black.
- (7) 6. ♂ not covered with grey sericeous pubescence; ♀ with the apical segment of the abdomen densely covered with black bristly hairs *niger*.
- (6) 7. ♂ covered with grey sericeous pubescence; ♀ with only a few scattered hairs on the apical segment *plumbeus*.
- (1) 8. Abdomen red at the base.
- (12) 9. Metathorax more or less pilose.
- (11) 10. Larger, the three red basal segments of the abdomen each with a black apical band *viaticus*.
- (10) 11. Smaller, the basal segments entirely red.. .. . *consobrinus*.
- (9) 12. Metathorax not pilose.
- (22) 13. Prothorax sharply angulated posteriorly.
- (17) 14. ♀ with the anterior tarsi simply spined, the spines short; ♂ either with the posterior tibiæ sinuate on the side towards the body and incrassated at the apex, or with the 3rd submarginal cell subquadrate, larger than the 2nd.

- (16) 15. ♂ with the posterior tibiæ sinuate, and incrassated at the apex; both sexes with the 3rd submarginal cell triangular *minutulus*.
 (15) 16. ♂ tibiæ simple, 3rd submarginal cell in both sexes subquadrate *spissus*.
 (14) 17. ♀ with the anterior tarsi pectinate; ♂ with the posterior tibiæ simple, and the 3rd submarginal cell triangular.
 (19) 18. ♂ with the apical segment of the abdomen with a long pendant spine; ♀ with the apical segment beneath somewhat compressed at the sides and subcarinate *Wesmæli*.
 (18) 19. ♂ and ♀ with the apical segment simple.
 (21) 20. ♂ with the 4th, 5th, and 6th segments beneath longitudinally depressed; ♀ apical segment above covered with bristly black hairs.. .. *chalybeatus*.
 (20) 21. ♂ with the segments of the abdomen beneath not depressed; ♀ with the apical segment bristly only at the sides *gibbus*.
 (13) 22. Prothorax arcuately emarginate *pectinipes*.

1. *rufipes*, Linn. Syst. Nat. ed. x. vol. i. p. 571. Fig. Curtis Brit. Ent. v. 238.

Black; legs red or black; abdomen with a yellowish white spot on each side at the base of the 2nd, 3rd, and sometimes 4th and 5th segments, and a white spot in the middle of the 6th, the spots on the 3rd often wanting, and I have a specimen with spots on the 2nd, 3rd, and 5th, but wanting those on the 4th segment; wings with a dark apical band. Head, thorax, including the metathorax, and the basal segment of the abdomen, with long hairs; front tarsi in the ♀ with very long spines; prothorax arcuately emarginate posteriorly; abdomen elongate and somewhat acuminate, apical segment in the ♀ beneath carinated, the apex largely rounded, the 6th emarginate; apical segment in ♀ above narrowly rounded, without long hairs.

Length, ♂ 7—10 mill., ♀ 9—15 mill.

Hab.—Ramsdown, Hants; Isle of Wight; Deal; Lowestoft.

2. *cinctellus*, Spin. Ins. Lig. ii. p. 39. Fig. Schiödte Krøy. Tids. i. pl. iv. fig. A.

♀ black, covered with a fine grey silky pubescence; head with a small pale spot on the inner margin of each eye; abdomen with a spot on the apical segment, and posterior tibiæ each with a small white spot at the base, their calcaria very long, almost as long as the basal joint of

the tarsi ; wings hyaline, dusky at the apex, 2nd and 3rd submarginal cells somewhat square, apical segment beneath carinate. Length 4—6 mill.

♀ black, legs red ; mandibles, a bilobate spot on the clypeus in front, a spot on each side of the face near the eye, and a spot on each side of the prothorax posteriorly, pale flavous ; wings hyaline ; front wings with a broad dark band near the apex but not covering it ; hind wings with a broad band at the apex ; abdomen with a glossy grey pubescence. Length 6—9 mill.

Hab.—On sandy banks. Chobham ; Southwold ; Devonshire.

3. *niger*, Fab. Syst. Ent. p. 350. Fig. Panz. Faun. Germ. 71, 19.

Entirely black ; thorax with a few scattered upright hairs ; prothorax angularly emarginate posteriorly ; metathorax finely pilose at the sides ; wings more or less clouded, with a dark apical band ; abdomen with the 2nd and 3rd segments at the base more or less covered with a greyish pubescence ; ♀ with the apical segment above covered with long bristly hairs ; ♂ with the apical segment of the body beneath compressed and carinated ; 3rd submarginal cell generally petiolated.

Length, ♂ 5—7 mill., ♀ 10—12 mill.

Hab.—Hawley, Hants ; Undercliff, Isle of Wight.

4. *plumbeus*, Fabr. Mant. i. p. 278 = *pulex*, Shuck.

♂ black, covered, except on the antennæ and at the base of the abdominal segments, with a silvery grey decumbent pubescence, which gives an ashy grey appearance to the insect ; prothorax emarginate posteriorly, but very slightly angulated ; wings hyaline ; front wings with a dark apical band ; abdomen beneath with only the apex of each segment grey, 5th segment beneath entire, not depressed, 6th formed much as in *chalybeatus*. Length 5—7 mill.

♀ differs in having the abdomen wider, and covered with finer grey hairs than the ♂, so that it has a grey appearance only at the apex of each segment. Length 6—9 mill.

Hab.—Common in many places. Southend, Weybridge, Hayling Island, Lowestoft, Southwold, Deal, Dover, Isle of Wight, Exeter, &c.

5. *viaticus*, Linn. Syst. Nat. ed. x. vol. i. p. 570
= *fuscus*, Smith. Fig. Panz. Faun. Germ. 65, 16.

Black; head and thorax, including the metathorax, with scattered black hairs, thicker and denser in the ♀ than the ♂; abdomen with the first three segments red, apex of the 3rd in the ♂ and of all three in the ♀ black, the 1st and 2nd in the ♂ dusky at the apex.

♂ with the head about as long as wide across the eyes; antennæ about as long as the thorax, the face below them covered with silvery hairs; prothorax very obtusely and angulately emarginate posteriorly; surface of thorax, under a strong power, seen to be finely and longitudinally rugose, covered with a very short grey pubescence, silvery on the metathorax, which has besides some scattered long hairs; wings dusky, with a dark apical band; abdomen elongate, $1\frac{1}{2}$ times as long as the thorax, 7th segment beneath large and subtruncate at the apex, 6th emarginate, with a small round fovea on each side of the emargination; legs spinose.

♀ differs from the ♂ in being much larger, with a shorter, wider body, the basal segment with a narrow straight dark band at the apex, the 2nd and 3rd segments each with a dark band, angularly produced in the centre; 4th, 5th, and 6th segments with black bristly hairs; wings rather darker than in the ♂.

Length 11—15 mill.

Common in sandy places.

6. *consobrinus*, Dbm. Hym. Eur. vol. i. p. 79.

Black, with the first two abdominal segments and the base of the 3rd red.

Much smaller than the preceding; prothorax more sharply and angulately emarginate posteriorly; abdomen without the black bands on the 1st and 2nd segments; apical segment in the ♀ with only a few scattered hairs; the ♂ has the apical segment beneath more pointed and carinated down the middle, the penultimate emarginate and somewhat squarely notched at the apex, depressed in the middle.

Very like the following in appearance, but at once distinguishable by the hairs of the metathorax.

Length 6—8 mill.

Hab.—Hayling Island ; on the sand-hills to the west of the island. Norwich, J. B. Bridgman.

7. *gibbus*, Fab. Syst. Ent. p. 350 = *trivialis*, Dhlb., &c.

♂ black, 1st and 2nd abdominal segments, and sometimes the base of the 3rd, red ; head, thorax, and legs covered with a very fine silvery pubescence, which gives them a glossy appearance ; face below the antennæ covered with bright silvery hairs ; clypeus very slightly emarginate ; apex of mandibles red ; prothorax angularly emarginate posteriorly ; wings with a broad, dusky, apical band, 3rd submarginal cell narrowed at the top ; abdomen elongate, $1\frac{1}{2}$ times as long as the thorax, apical segment beneath narrowly rounded at the apex, very convex, 6th notched at the apex, with an impression on each side of the notch, 5th almost entire, not depressed in the middle.

♀, head and thorax with a silvery gloss ; apical margin of the clypeus slightly emarginate, slightly raised and margined at the sides, largely and irregularly punctured, with a series of several long setæ above the apical margin ; head and prothorax with a few long bristly hairs ; abdomen much shorter and wider than in the ♂, apical segment above, and all the segments beneath, with a few long hairs.

Length 7—11 mill.

Common on sandy commons, &c.

8. *chalybeatus*, Schiödte. Kröyer's Nat. Tidskr. i. p. 338,

♂ dark var., = *sericatus*, Shuck. ?

So like *gibbus* that it is only necessary to point out the distinguishing characters.

♂ differs in having the 5th and 6th segments of the body beneath longitudinally depressed, the 4th emarginate, the 5th deeply and squarely notched, and the 6th trilobate, the central lobe slightly emarginate at the apex.

♀ differs in having the clypeus very smooth and shining in front, its margin not raised at the sides, and with only two stiff setæ projecting from above the glabrous margin ; the apical segment of the body is much more densely covered with black hairs, and the 3rd submarginal cell is more triangular.

Hab.—Chobham, Southwold, Worthing, &c.

9. *Wesmaeli*, Thoms. Op. Ent. p. 221. Hym. Scand. iii. p. 149. Fig. Ent. Mo. Mag. xvii. p. 98.

Very like *gibbus*, but easily distinguished by the slightly carinated ventral anal plate of the ♂, which has near its apex a long pendant spine; the ♀ is more difficult to recognise, but has the apical segment beneath somewhat compressed and carinated.

Hab.—Chobham Common; rare.

10. *minutulus*, Dahlbm. Dispos. 1842, p. 10. Fig. Ent. Mo. Mag. xvii. p. 97 = *cellularis*, Thoms.

Black, the two basal segments of the abdomen and the base of the third red; the apex of the 2nd segment in the ♂ more or less fuscous; face below the antennæ, sides of the thorax, the metathorax, and the coxæ, covered with silvery pubescence; prothorax sharply emarginate posteriorly; wings with a broad fuscous apical band, 3rd submarginal cell triangular; ♂ with the posterior tibiæ sinuate on the side towards the body, and incrassated at the apex; ♀ with the anterior tarsi simply spinose, not pectinated as in most of the species.

Closely allied to *spissus*, but differing in the shape of the tibiæ in the ♂, and the triangular 3rd submarginal cell in the ♀.

Length 8—9 mill.

Hab.—Chobham Common.

11. *spissus*, Schiödte. Kröyer's Tidskr. i. p. 336.

♂ differs from *gibbus* ♂ in having the 3rd submarginal cell more quadrate and generally as large or larger than the 2nd; the apex of the wings with a well-defined dark band; abdomen broader and somewhat oval, apical segment beneath compressed and spinosely hairy at the extremity, 6th segment deeply emarginate, the sides of the emargination bisinuate, 5th segment slightly emarginate at the apex. Length 8 mill.

♀ differs from *gibbus*, &c., in having the prothorax destitute of hairs and the anterior tarsi without long spines, as in its allies, but only with short ones like the ♀ of *niger*; wings with a well-defined dark apical band, the 3rd submarginal cell large as in the ♂. Length 9—10 mill.

Hab. — Glanvilles Wootton, Dorset; Bristol, Yorkshire, &c.

12. *pectinipes*, V. d. Lind. Nouv. Mem. Acad. Brux. iv. p. 351.

Like *gibbus* in colour and size. Head and thorax covered with an extremely fine glossy pubescence, which gives them a silvery appearance in some lights, and in others appears more or less brown; head narrower than in *gibbus*, in proportion to the thorax, and the antennæ shorter and stouter; prothorax arcuately emarginate posteriorly, not angulated; abdomen with the base of the 1st, 2nd, and 3rd segments covered with a sort of glaucous bloom. The ♂ differs in having the prothorax arcuate posteriorly like the ♀, and the apical segment of the abdomen beneath with a central carina uniting at the base with two lateral ones, 6th segment deeply notched, 5th entire.

Length 6—9 mill.

Not a common insect. Chobham, Deal, Southwold, Hampstead, Southend, &c.

I have followed Wesmael and Thomson in my selection of a ♂ for this species. The ♂ assigned to it by Smith is, I have no doubt, the ♂ of *chalybeatus*, and in many respects seems to agree with the ♀ here described, but Wesmael and Thomson have described a ♂ agreeing with *pectinipes* ♀ in having the arcuate posterior margin to the prothorax, and, although I have never seen a British specimen with this character, I have no doubt they are right in their selection; *chalybeatus* ♂ has the posterior margin of the prothorax very distinctly angulated.

The following species are unknown to me, so I quote F. Smith's descriptions:—

1. *acuminatus*, Sm. Cat. Brit. Hym. p. 119.

“ ♂ (length 4 lines). Black, head very delicately punctured, with a few larger scattered punctures; the face below the antennæ covered with a thin silvery pile, the labrum concealed, the antennæ about the length of the thorax, robust, and of uniform thickness, except the apical joint, which is acuminate; thorax very delicately punctured, the metathorax much more strongly so, and having, particularly at the sides, a silvery pubescence;

the sides of the thorax and all the coxæ are covered with a changeable silvery pile, and the wings are slightly clouded at their margins; the second submarginal cell is large and oblong, the third becomes gradually about one-third narrower towards the marginal; the legs nigro-piceous, the anterior pair simple, the intermediate and posterior pairs slightly ciliated; abdomen narrower than the thorax, smooth and shining, and thinly covered with a silvery pile, the exterior apex piceous."

Hab.—Kirkpatrick-Juxta, Moffat, Scotland.

2. *approximatus*, Sm. Entom. iv. p. 226.

= *melanarius*, Bold. Ent. Mo. Mag. iv. p. 226.

"Closely resembles *P. niger*, but is a larger insect, its mandibles are entirely black except the extreme apex, which is obscurely rufo-piceous; *P. niger* has three teeth in the mandibles, one large and two small ones; the new species has a single tooth, which is only slightly notched inwardly; the 3rd submarginal cell is quadri-lateral and is considerably larger than the 2nd sub-marginal, and the nervures of the wings are much stronger than in *P. niger*; the latter insect always has the 3rd submarginal either triangular or petiolated; in the ♂ that cell appears to be always petiolated. The distinctions enumerated will serve to distinguish the new species."

PRIOCNEMIS.

Schiödde. Kröyer's Tidskr. i. p. 394.

Differs from *Pompilus* in having the vertex distinctly punctured in both sexes, and the posterior tibiæ serrate externally in the ♀. All our British species have the abdomen red at the base, with the exception of the ♂ of *P. hyalinatus*. The ♂ in the various species is easily distinguished by the form of the ventral anal plate, but the ♀ is in some cases very difficult to determine with certainty.

- (2) 1. Metathorax pilose *fuscus*.
- (1) 2. Metathorax not pilose.
- (4) 3. Wings clear, with a broad well-defined brown apical margin *affinis*.
- (3) 4. Wings without a well-defined apical band.
- (14) 5. Wings without a clear well-defined brown spot near the apex in the ♀; abdomen red at the base in both sexes.

- (9) 6. Prothorax posteriorly very deeply and sharply angulated; cubital nervure of front wings in ♂ quite reaching, in ♀ nearly reaching, the apical margin; ventral apical segment in ♀ not carinated.
- (8) 7. ♂ legs black, except margin of front tibiae, ventral apical segment broader; ♀ wings full and long; both sexes with the externo-medial nervure distinctly bisinuate where it crosses the base of the 1st submarginal and 2nd discoidal cells *exaltatus*.
- (7) 8. ♂ legs more or less red, ventral apical segment narrower; ♀ wings shorter; both sexes with the externo-medial nervure almost describing a continuous curve *notatus*.
- (6) 9. Prothorax less deeply angulated; cubital nervure in both sexes not nearly reaching the apical margin of the wings; ventral apical segment in ♀ carinated.
- (13) 10. ♂ with the sides of the apical ventral segment fimbriated, or with a central pilose carina; ♀ with a clear round white hyaline spot near the apex of the front wings.
- (12) 11. ♂ sides of anal segment beneath not fimbriated, apex entire, centre with a pilose carina; ♀ larger than next species, femora and tibiae more or less red, apex of clypeus shining .. *obtusiventris*.
- (11) 12. ♂ sides of anal segment beneath fimbriated with long black hairs, apex deeply notched, centre depressed; ♀ smaller than preceding, legs entirely black, clypeus dull at the apex .. *pusillus*.
- (10) 13. ♂ apical segment very narrow, with the sides not fimbriated, and centre without a pilose carina; ♀ without a clear round apical spot to the wings *parrulus*.
- (5) 14. Upper wings in ♀ with a distinct sharply defined brown spot covering the marginal, 2nd and 3rd submarginals, and part of the 3rd discoidal cell; ♂ with the femora more or less red, and the abdomen black *hyalinatus*.

1. *fuscus*, Linn. Faun. Suec. Ed. Alt. p. 412=*sepicola*, Smith. Fig. Panz. Faun. Germ. lxx. 15.

Head and thorax black, with black bristly hairs; metathorax pilose; 1st, 2nd, and 3rd segments of abdomen red, the rest black; legs black; anterior tibiae in the ♂ testaceous in front.

♂, vertex of head distinctly punctured; prothorax angulately emarginate posteriorly; wings dusky towards the apex, with a transverse stain across the 2nd and 3rd submarginal cells; metathorax evenly rounded, opaque, with very fine erect hairs; abdomen elongate-ovate, somewhat shining, apical segment beneath deeply emarginate, fringed at the sides. Length 12 mill.

♀ differs in being larger and more robust, with a much wider abdomen, the 4th, 5th, and 6th segments with long bristly hairs above, and all the segments hairy beneath; coxæ and femora hairy; posterior tibiæ serrate. Length 15—18 mill.

2. *affinis*, V. d. Lind. Nouv. Mem. Acad. Brux. iv. p. 237.

Like *fuscus* in colour, but with the front legs entirely black in ♂; ♂ prothorax very sharply angulated posteriorly; metathorax not pilose; wings with a distinct dark apical band, extending to the edge of the 3rd submarginal cell; abdomen rather longer and less shining than in *fuscus*, apical segment beneath widely rounded at the extremity, not emarginate, and fringed, carinated at the base; 6th segment depressed, emarginate at the apex. Length 9 mill.

♀ differs in being stouter and larger, with the posterior margin of the prothorax arcuately emarginate; abdomen covered with a fine white silky pile, apical segment with long black hairs. Length 10—15 mill.

Hab.—Rare. Chobham, Ripley, Weybridge, Southend, Deal, Walmer, and Norfolk.

3. *exaltatus*, Fab. Syst. Ent. p. 351.

♂, head and thorax black, finely punctured; prothorax very deeply emarginate posteriorly; metathorax and sides of the mesothorax more or less silvery; upper wings dusky towards the apex, sometimes with a clearer spot beyond the 3rd submarginal cell; cubital nervure extending to the exterior margin of the wing; abdomen with the 1st and 2nd segments and the base of the 3rd red, the rest black; apical segment beneath largely rounded at the apex, punctured, and pilose; 6th segment smooth and shining at the apex, and slightly emarginate, with an impression on each side bounded by a smooth raised line; legs black, front tibiæ red on their anterior margin; coxæ and femora more or less silvery; inner calcaria of hind tibiæ very long, more than three-fourths as long as the basal joint of the tarsi. Length 9 mill.

♀ differs from the ♂ in being more robust and having the wings dusky at the apex, with a clear round hyaline spot beyond the apex of the 3rd submarginal cell; cubital nervure almost reaching the margin of the

wing; apical segment of the body pilose, not carinated beneath; front legs entirely black; calcaria pale, much shorter than in ♂. Length 12—15 mill.

Hab.—Littlehampton, Norwich, Lowestoft, Chobham, Hastings, &c., generally common.

4. *notatus*, Rossi. Faun. Etrusc. Mant. i. p. 127.

Extremely like the preceding, but generally smaller. ♂ differs from that of *exaltatus* in having the femora and tibiæ of all the legs more or less ferruginous, the apical segment of the abdomen beneath narrower, and the externo-medial nervure almost describing a continuous curve as it crosses the base of the 1st submarginal and the 2nd discoidal cells. Length 6 mill.

♀ differs from *exaltatus* in being smaller, with shorter wings in proportion; the legs often more or less red; and the neuration of the wings as in the ♂. Length 6—8 mill.

Rare. Highgate, Deal, Ripley, Chobham.

5. *obtusiventris*, Schiödte. Kroyer's Nat. Tidskr. i. p. 329
= *agilis*, Shuck., Smith, &c.

Very like the two preceding, but easily distinguishable by the more obtuse emargination of the base of the prothorax. The ♂ may be further distinguished by the narrow apical ventral segment, which bears a slightly raised, pilose, central carina, and by the shorter calcaria of the posterior tibiæ, which do not extend to three-fourths the length of the basal joint of the tarsi. Length 3 mill.

The ♀ also differs in having the apical segment of the body beneath, with a smooth carina, and the posterior femora at the apex and the tibiæ red. Length 4—5 lines.

Hab.—Erith, Darenth, Harrow, Littlehampton.

6. *pusillus*, Schiödte. Kroyer's Nat. Tidskr. i. p. 327.

Smaller than the preceding; ♂ readily recognised by the emarginate apical ventral segment, which is wide and rounded at the sides, and has its sides fimbriated; the 6th segment is slightly emarginate at the apex, with an impression on each side of the emargination.

♀ differs in the smaller size, and entirely black legs,

legs, and in having the apex of the clypeus dull, whereas in *obtusiventris* it is shining. The obtuse emargination of the prothorax separates it from *exaltatus* or *notatus*, and also the carinated apical ventral segment.

Hab.—Chobham, and probably in other localities, but I expect overlooked.

7. *parrulus*, Dahlb. Hym. Eur. i. p. 460.

♂ very like the ♂ of the preceding, but rather smaller, and with the apical ventral segment narrow and truncated at the apex, the sides not fimbriated, and the centre keeled at the base.

♀ differs from all its allies by having no clear round spot near the apex of the front wings, but has a dusky streak running through the 2nd and 3rd submarginal cells, and a dusky spot in the 3rd discoidal cell. There is also a slight cloud across the base of the 1st submarginal cell; apex of the wings widely clouded.

Hab.—Chobham; Charlwood, Surrey; Scotland.

8. *hyalinatus*, Fab. Ent. Syst. ii. p. 212 = *fasciatellus*, Shuck.

♂ black, head finely and closely punctured; prothorax angularly emarginate behind; mesothorax posteriorly slightly raised down the middle; metathorax evenly rounded, covered with white silvery hairs; wings more or less dusky, darker towards the apex; abdomen elongate, black, basal joint more or less covered with silvery pubescence; legs with the posterior coxæ silvery; femora sometimes entirely black, except the tips of the front pair, sometimes nearly all red, tarsi dusky, first joint of front pair red. Length 3—4 lines.

♀ black with a silvery gloss, two basal segments of abdomen red, apex of the 2nd generally with a black central spot, and the red colour sometimes extending at the sides on to the 3rd segment; head and thorax with erect hairs; prothorax arcuately emarginate posteriorly; metathorax subglobose, smooth, and shining, with scattered erect hairs; wings dusky along the externo and transverso-medial nervures, and with a broad spot covering the marginal, 2nd and 3rd submarginals and part of the 3rd discoidal cell, 3rd submarginal larger than 2nd; 5th segment of abdomen sparsely, and 6th densely

covered with hairs, posterior tibiæ externally serrate and spined. Length 4—4½ lines.

Hab.—Camberwell, Highgate, Hampstead, Fulham.

AGENIA, *Schiodte*. (Pl. VII. fig. 16).

Kröy. Tidskr. i. p. 321.

Closely allied to *Prionemis*, but the females with simple tibiæ.

- (4) 1. Front wings with a dark band near the apex.
- (3) 2. Prothorax angulately emarginate posteriorly; metathorax punctured *bifasciatus*.
- (2) 3. Prothorax arcuately emarginate posteriorly; metathorax transversely rugose.. . . . *variegatus*.
- (1) 4. Front wings not banded *punctum*.

1. *variegata*, Linn. Syst. Nat. ed. x. vol. i. p. 570.
Fig. Panz. Faun. Germ. 87, 21.

Black; head and thorax punctured; anterior wings with a narrow band along the transverso-medial and externo-medial nervures, and a wide band covering the radial, 2nd and 3rd submarginals, and part of the 3rd discoidal cell, brown; the extreme apical margin of the wing also of that colour; these bands are only faintly indicated in the ♂; prothorax arcuately emarginate posteriorly; metathorax transversely rugose and punctured; abdomen shining, finely and closely punctured; abdomen in the ♂ somewhat elongate, with the apical segment beneath narrow and carinated, the crest densely covered with long hairs; abdomen in the female shorter and wider, the apex covered with bristly hairs; legs black. Length 7—9 mill.

Rare. Coombe Wood, Wakefield, Yorkshire, &c.

2. *bifasciata*, Fab. Ent. Syst. ii. p. 212. Fig. Panz. Faun. Germ. 86, 11.

Very like the preceding, but with the prothorax angulately emarginate posteriorly, and the metathorax shining and punctured, not transversely rugose; ♂ with the apical segment of the abdomen beneath with an elevated crest, not covered with long hairs, as in *variegata*. Length 7—9 mill.

Rare. New Forest, Colney Hatch, Hampstead, Norwich, Coombe Wood, N. Wales, &c.

3. *punctum*, Fab. Spec. Ins. p. 448. Fig. Panz. Faun. Germ. 86, 12 = *petiolatus*, Shuck.

Black; ♂ with the sides of the face, mandibles, and a spot on the anal segment, white.

Head and thorax finely and closely punctured; prothorax arcuately emarginate; wings without transverse dark bands; metathorax finely and transversely rugose; abdomen exceedingly finely and closely punctured, and covered with a fine sericeous pubescence; apex with a few irregular hairs; legs with a few very short spines on the tibiæ; ♂ with the apical segment beneath, narrow and somewhat carinated in the middle. Length 7—9 mill.

Hab. — London district, Canterbury, Birch Wood, Bexley, Hammersmith, &c.

CEROPALES, Latr. (Pl. VII. fig. 17).

Hist. Nat. xiii. p. 283.

Differs from the rest of the *Pompilidæ* in having the antennæ at some distance above the clypeus, and in having four submarginal cells in the upper wings; both our species have white markings on the thorax and abdomen.

- (2) 1. Body not red at the base *maculatus*.
(1) 2. Body red at the base *variegatus*.

1. *maculatus*, Fabr. Syst. Ent. p. 345. Fig. Panz. Germ. 72, 9 (*frontalis*).

♂ black; surface of head and thorax very finely rugose, with large shallow scattered punctures; abdomen shining, finely punctured; face beneath the antennæ and along the sides of the eyes, a spot on the 1st and 2nd joints of the antennæ, a semicircular line at the base of the prothorax, the scutellum, the apex of the metathorax on each side, a spot on each side of the 1st, a band at the apex of the 2nd, and a spot on the 5th and 6th, as well as two on the 7th segment of the abdomen, pale yellowish white; legs testaceous-red; femora more or less black; tibiæ dark at the apex; coxæ each with a pale spot; ventral anal segment with its sides widely reflexed.

♀ only differs in being longer, with the face black

down the centre, almost to the margin of the clypeus ; labrum black. Length 7—10 mill.

Hab.—Usually on *Daucus carota*, July and August. Worthing ; N. Wales ; Penzance ; Birch Wood ; Erith ; Hawley, Hants ; Isle of Wight ; Yorkshire ; Lowestoft.

2. *variegatus*, Fab. Ent. Syst. Suppl. 241, 2, 3. Fig. Smith, Brit. Foss. Hym. pl. ii. fig. 10.

Differs from the preceding in having the labrum white in both sexes, the prothorax posteriorly with only two transverse spots instead of a continuous band, the basal segment and the base of the 2nd segment of the abdomen red ; the 2nd segment also with a pale spot on each side at the apex, and the 6th segment with a large round spot in the middle ; anterior coxæ pale in front ; intermediate and posterior coxæ with a pale spot on the side, near the apex ; legs red ; apex of posterior femora and tibiæ dark. Length 6—7 lines.

Hab.—Devonshire ; Parley Copse, Hants ; Weybridge ; Chobham ; very rare ; July and August.

DIVISION II.

Prothorax often consisting of little more than a narrow collar ; its posterior angles lobately produced, but in no case extending to the tegulæ ; female not apterous.

- (13) 1. More than one submarginal cell.
- (3) 2. Head and thorax covered with long hairs ; abdomen with a long smooth round petiole .. *Sphegidae*
- (2) 3. Head and thorax rarely covered with long hairs ; abdomen without a long round petiole ; if with a petiole, as in *Pemphredon*, then with the petiole flattened.
- (5) 4. Mandibles with a deep incision in their outer margin at some distance from the base, or with the marginal cell appendiculated .. *Larridae*.
- (4) 5. Mandibles with their outer edge single ; marginal cell not appendiculated.
- (7) 6. Two submarginal cells *Pemphredonidae*.
- (6) 7. Three or four submarginal cells.
- (11) 8. Abdomen not strongly and deeply punctured, except occasionally on the basal segment.
- (10) 9. Abdomen black, or black and red, with a distinct petiole *Mimesiidae*.
- (9) 10. Abdomen red and black, not petiolated ; or with black and yellow markings ; in the latter case sometimes with a petiole *Nyssonidae*.

- (8) 11. Abdomen striped with black and yellow bands
strongly and deeply punctured on all the
segments *Cerceridæ*.
(1) 13. One submarginal cell *Crabronidæ*.

SPHEGIDÆ.

AMMOPHILA, Kirby. (Pl. VII. fig. 18).

Trans. Linn. Soc. iv. p. 195] = *Miscus*, Jur. Hym. i. p. 130.

The long round petiole of the abdomen, which is sometimes composed of the 1st and part of the 2nd segments, is a character by which this genus may be at once recognised. *Miscus* used to be considered a distinct genus on account of the petiolation of the 3rd submarginal cell; but this is a very variable character, as I have specimens of *Miscus* with the cell simply triangular, and no petiole; this being the case, I have considered it as synonymous with *Ammophila*.

- (4) 1. 2nd segment of body, viewed sideways, scarcely widened posteriorly.
(3) 2. 3rd submarginal cell not petiolated; metathorax irregularly rugose *sabulosa*.
(2) 3. 3rd submarginal cell petiolated; metathorax diagonally rugose in regular lines *campestris*.
(1) 4. 2nd segment of body much widened posteriorly.
(6) 5. Larger and more robust; petiole shorter, with long hairs beneath *hirsuta*.
(5) 6. Smaller and more slender; petiole longer, naked beneath *lutaria*.

1. *sabulosa*, Linn. Syst. Nat. ed. x. i. p. 569. Fig. Panz. Faun. Germ. 65, 12.

Black; 2nd, 3rd, and base of 4th abdominal segments, red; spotted with black above in the ♂.

Head and thorax covered with long grey hairs; face in the ♂ with short adpressed silvery hairs; thorax rugosely and shallowly punctured; mesothorax with an impressed dorsal line; metathorax irregularly rugose; 1st segment of the body very long and cylindrical, longer than the 2nd; 2nd, looked at from above, slightly widening to the apex; looked at sideways, nearly equally wide throughout; the remaining segments forming a somewhat regular oval; apical segment in the female with long bristly hairs at the sides; legs black; anterior

and intermediate tibiæ, and all the tarsi spined in the ♀. Length 18—22 mill.

Common on sandy banks, &c.

2. *campestris*, Ltr. Gen. Crust. & Ins. iv. p. 54. Fig. Curtis, Brit. Ent. xiii. pl. 464.

Differs from the preceding in having the 3rd sub-marginal cell petiolated (*i. e.*, almost always), and the metathorax finely and regularly transversely rugose, the rugosities in distinct diagonal lines meeting along the centre; the colour of the abdomen in the male generally darker than that of *sabulosa*, and more densely covered with silvery hairs. Length 15—20 mill.

Hab.—Often with the preceding, but generally less common; abundant however near Chobham, Weybridge, &c.

3. *hirsuta*, Scop. Ent. Carn. p. 292, No. 772 = *viatica*, Smith. Fig. Sow. Brit. Misc. i. pl. xxxiii. fig. 1.

♂, head and thorax black; largely and rugosely punctured, densely covered with hairs, which are black on the head and prothorax, and more or less grey on the rest of the body; metathoracic area rugose, not diagonally striate; petiole of the abdomen black, with long hairs beneath, rather longer than the 2nd segment; 2nd, 3rd, and base of the 4th segment red, the rest black; abdomen covered with a very short grey sericeous pubescence, giving it a more or less silvery appearance; 2nd segment much widened posteriorly; legs black; coxæ and femora with long hairs.

♀ differs in being larger and more robust, and in having the head and thorax, &c., densely covered with black hairs. The body also is larger and more shining, being glabrous, without the sericeous pubescence of the ♂. All the tibiæ spinose; posterior tibiæ with a dense silky pubescence on their inner side. Length 15—20 mill.

Hab.—Common in sandy places.

Can only be confounded with the following; it differs from the preceding at once by the shape of the 2nd abdominal segment, which in this species is much widened behind, and by the great hairiness of the head and thorax.

4. *lutaria*, Fab. Mant. i. p. 273, = *affinis*, Kirb., Shuck., &c.

Differs from the above in having the metathoracic area diagonally and rugosely striate, instead of clathrately rugose; the petiole without the long line of hairs beneath, and the head and thorax less closely punctured; it is also not quite so densely covered with hairs, and has the 2nd abdominal segment black at the base. Length 15—20 mill.

Hab.—Littlehampton, Chobham, Lowestoft, Southend, Deal; August, &c.

LARRIDÆ.

- (6) 1. Mandibles with a deep incision in their outer margin.
 (3) 2. Three submarginal cells *Tachytes*.
 (2) 3. Two submarginal cells.
 (5) 4. The outer one petiolated *Miscophus*.
 (4) 5. The outer one not petiolated.. .. *Dinetus*.
 (1) 6. Mandibles simple *Astata*.

TACHYTES, *Panz.* (Pl. VII. fig. 19).

Krit. Revis. ii. p. 129.

A well-marked genus, and easily recognised. One of our British species, *T. pectinipes*, somewhat resembles a small *Astata*, but the externally dentate mandibles at once distinguish it; anterior wings with three submarginal cells, the 2nd cell receiving both recurrent nervures, the third very long and narrow, and much produced at its lower apical angle; radial cell appendiculated.

- (2) 1. Body with the base red *pectinipes*.
 (1) 2. Body entirely black *unicolor*.

1. *pectinipes*, Linn. Syst. Nat. ed. x. vol. i. p. 570. Fig. Panz. Faun. Germ. 89, 13, and 106, 13, ♀.

Black, 1st and 2nd, and sometimes part of the 3rd, abdominal segments red. Head and thorax very closely and deeply punctured, face below the antennæ and along the sides of the eyes with silvery golden hairs; abdomen finely punctured and covered with exceedingly short grey hairs, which give it a silvery appearance at the sides; apical segment in the ♂ narrowly truncate, and somewhat

emarginate; in the ♀ acuminate and shining, with a raised line down each side, the surface with large and scattered punctures; tarsi more or less red, front tarsi in ♀ with very long spines; under side of thorax and legs with silvery hairs.

Length 8—10 mill.

Hab.—Sandy places; common.

2. *unicolor*, Panz. Faun. Germ. 106—16.

Very like the preceding, but entirely black, except the reddish ends of the tarsi; both sexes, however, differ in the coarser puncturation of the abdomen; the ♂ has the 7th segment simply rounded at the apex, and in the ♀ the appendix to the radial cell is scarcely visible.

Length 8—9 mill.

Hab.—Chobham, Isle of Wight, Hayling Island, Sandhurst, Weybridge, Deal. Rare.

MISCOPHUS, *Jurine*. (Pl. VII. fig. 20).

Nouv. Meth. Hym. p. 206.

Like a small *Tachytes*, but differing in having only two submarginal cells, the 2nd submarginal cell petiolated, and only receiving the 2nd recurrent nervure.

- (2) 1. Head and thorax black; ♀ with abdomen more or
less red at the base *bicolor*.
(1) 2. Head and thorax bronzy black; ♀ with abdomen
entirely black *maritimus*.

1. *bicolor*, Jur. Hym. p. 206. Fig. Smith, Brit. Foss.
Hym. pl. iii: fig. 4.

♂ black, sometimes with the basal segment of the abdomen more or less red. Head and thorax closely and evenly punctured, the former with silvery hairs on the face; metathorax longitudinally rugose, with a raised line down the middle; body punctured; metathorax, sides of thorax, and abdomen near the apex of each segment, with silvery hairs; legs silvery on their under sides; wings clouded at the apex.

♀ rather larger than the ♂, with the two basal segments of the abdomen red; the extreme apex of the 2nd black.

Length 6—7 mill.

Hab.—Chobham, Weybridge, Coombe Wood, Sandhurst, &c.; generally rare, but I have met with it pretty commonly on Chobham Common in July. It is exceedingly active and difficult to catch.

2. *maritimus*, Sm. Brit. Foss. Hym. p. 91.

Differs from the above in the brassy tinge of the head and thorax, the comparatively longer metathorax, and the entirely black abdomen of the ♀.

Hab.—Sand-hills, Deal, F. Smith. I have never seen this species.

DINETUS, *Jur.* (Pl. VII. fig. 21).

Nouv. Meth. Hym. p. 208.

The neururation of the wings, alone, separates this genus off from its allies; the radial cell is short and truncate at its apex, and widely appendiculated; there are only two submarginal cells, neither of which are petiolated, and each of which receives a recurrent nervure.

1. *pictus*, Fabr. Ent. Syst. ii. 299. Fig. Smith Brit. Foss. Hym. pl. iii. fig. 3.

Head black, very closely punctured, with a streak behind each eye and the mandibles in both sexes flavous; the ♂ has, besides, the face and the antennæ of the same colour, the latter organs in this sex curved in a spiral sort of twist, rather above their middle. Thorax black and punctured like the head; collar, tubercles, tegulæ, scutellum, and post-scutellum flavous; metathorax with a wide line of silvery pubescence on each side; abdomen in the ♂ with the first three segments flavous, their apical margins brown, the 4th and 5th brown, with a paler transverse spot at the apex, 6th and 7th testaceous; ♀ with the first three segments testaceous-red, the last three black, the 2nd, 3rd, and 4th each with a small yellow spot on each side at the apical margin, 5th with a pale apical band, and 6th with a large triangular apical spot, extreme apex testaceous-brown; legs flavous, except the posterior femora, in the ♂; ♀ with the femora black, except a white spot at the apex of the 1st and 2nd pairs beneath; tibiæ and tarsi pale, the former black inwardly.

Length 8 mill.

Hab.—Windsor, Ascot. Very rare.

ASTATA, *Latr.* (Pl. VII, fig. 22).

Precis. Caract. Gen. Ins.

Eyes in the ♂ touching each other on the vertex ; mandibles in both sexes simple externally ; front wings with three submarginal cells, the nerve which separates the 1st and 2nd angulated and slightly spurred at the angle, radial cell appendiculated ; metathorax elongate, finely clathrate or reticulated. Both our British species are found in sandy places, and seem to enjoy the hottest sunshine they can find, basking on the sand. They are very wary and difficult to approach.

- (2) 1. Larger, ♂ with the forehead unspotted ; ♀ with the thorax strongly punctured ; metathorax in both sexes regularly clathrate *boops*.
 (1) 2. Smaller, ♂ with a yellow transverse spot on the forehead ; ♀ with the thorax scarcely punctured ; metathorax in both sexes very finely reticulated *stigma*.

1. *boops*, Schir. Ins. Austr. 384. Fig. Smith Foss. Hym. pl. iii. fig. 5.

Black, shining, three basal segments of the abdomen more or less red.

♂ face covered with silvery hairs ; eyes touching each other on the vertex ; head behind the eyes, prothorax, mesothorax in front, and metathorax at its base and round the sides, basal segment of the abdomen above and all the segments beneath, with long hairs ; thorax somewhat finely punctured ; scutellum smooth and shining, with a central line, and a few large punctures ; metathorax finely and regularly clathrate ; body extremely finely reticulated, with a few scattered punctures ; legs black ; posterior tibiæ inwardly covered with velvety pubescence.

♀ differs in having the eyes remote on the vertex, the thorax and head more shining, with larger scattered punctures.

The wings in both sexes more or less brown near the apex.

Length 10—12 mill.

Hab.—Hampstead, Coombe Wood, Hawley Hants, Isle of Wight, Reigate, Chobham, Hayling Island, near Lowestoft, and Southwold ; in sandy places.

2. *stigma*, Panz. Faun. Germ. 107, 13.

Smaller than *boops*. The ♂ has a double, transverse cream-coloured spot just above the insertion of the antennæ; the thorax is dull and shallowly punctured; the metathorax is so finely reticulated that it only presents a dull appearance, except under a strong power, and differs in this very notably from *boops*, where the reticulation is large and very distinct.

The ♀ differs in having the thorax smooth, with only a very few large scattered punctures.

Length 7—8 mill.

Hab.—Weybridge, Deal, Chobham, Littlehampton, N. Wales.

Very rare, and the ♂ very difficult to catch; it sits down in the bright sun on the most exposed sandy places, and is generally off before a net can be got over it. I have only taken two males, both at Chobham in June, but neither males nor females appear to come out except on the hottest days.

PEMPHREDONIDÆ.

- (4) 1. One recurrent nervure.
- (3) 2. Anastomising with 1st transverse cubital nervure *Spilomena*.
- (2) 3. Joining the cubital nervure about the middle of
the 1st submarginal cell *Stigmus*.
- (1) 4. Two recurrent nervures.
- (8) 5. Head and thorax without long pilose hairs.
- (7) 6. Labrum triangular, notched at the apex .. *Diodontus*.
- (6) 7. Labrum produced into a simple point at the apex *Passalæcus*.
- (5) 8. Head and thorax covered more or less sparsely
with long pilose hairs.
- (10) 9. Face simple between the antennæ *Pemphredon*.
- (9) 10. Face between the antennæ with a blunt tubercle
or spine *Ceratophorus*.

SPILOMENA, Shuck. (Pl. VII. fig. 23).

Trans. Ent. Soc. ii. p. 79 = *Celia*, Shuck. Brit. Foss.
Hym. p. 182.

This and the following genus are remarkable for the very large stigma of the anterior wings, and are amongst the smallest of our Aculeates. *Spilomena* has two submarginal cells, the 2nd somewhat diamond-shaped, the recurrent nervure joining the 1st transverse cubital nervure. Abdomen nearly sessile.

1. *troglydites*, V. de Lind. Nouv. Mem. Acad. Brux. v. p. 76.

♂ black; legs, antennæ, clypeus, mandibles, a spot on each side of the face, and the tegulæ, yellow; head and thorax dull, finely and closely punctured; metathorax transversely rugose, sharply truncate posteriorly, its sides and apical margin slightly raised, its disk with two longitudinal raised lines; wings with the stigma very large and semicircular; abdomen bright and shining.

♀ differs in having the clypeus black, the face unspotted, and the antennæ and mandibles piceous; the legs and tegulæ also piceous; the femora nearly black.

Length $2\frac{1}{2}$ —3 mill.

Hab.—London district; Charlton, Kent, burrowing in hard white sand, F. Smith; Charlwood, Surrey, &c.

STIGMUS, *Jurine*. (Pl. VII. fig. 24).

Nouv. Meth. Hym. p. 139, pl. iii.

Like the preceding genus in most of its characters, but differs in having the abdomen petiolated, and the recurrent nervure received in the middle of the 2nd submarginal cell.

1. *pendulus*, Panz. Faun. Germ. 86, 7.

♂ and ♀ black; antennæ, mandibles, tegulæ, anterior and intermediate tibiæ and base and apex of posterior tibiæ, all the tarsi, and the extreme apex of the femora, pale testaceous. Head rather wider than the thorax, vertex nearly square in the ♀; clypeus and face below the antennæ, covered with silvery hairs in the ♂, the apical margin of the former in the ♂ simple, in the ♀ deeply notched; prothorax longitudinally sulcate, with its angles prominent; mesothorax in front with two raised smooth longitudinal lines, its surface exceedingly finely and longitudinally striate (this can only be seen under a very strong lens), its lateral margins reflexed, the division between the mesothorax and scutellum crenate, as also the lateral reflexion; metathorax largely and clathrately rugose, with a raised central longitudinal line and two others on each side of it, the inner ones of which are divided into two at the base; wings with the stigma

very large and more elongate than in *Spilomena*; abdomen shining, its petiole rugose and longitudinally sulcate.

Length 5—6 mill.

Hab.—London district, Tunbridge Wells, Chobham (bred from pierced stems of brambles), &c.

Diodontus, *Curt.* (Pl. VII. fig. 25).

Brit. Ent. ii. 496.

Labrum produced and emarginate at the apex; anterior wings with two submarginal cells, each receiving a recurrent nervure, the 2nd cell longer than wide; abdomen with a short, wide petiole; posterior tibiæ more or less spinose.

- (2) 1. Mandibles yellow *minutus*.
- (1) 2. Mandibles black.
- (4) 3. Thorax finely and closely punctured; division between the scutellum and thorax consute .. *tristis*.
- (3) 4. Thorax with scattered punctures; division between the scutellum and thorax simple *luperus*.

1. *minutus*, Fab. Ent. Syst. ii. p. 302.

♂ and ♀ black; mandibles, tegulæ, tubercles, extreme apex of the femora, the base of the tibiæ, and the whole of the anterior tibiæ and tarsi, except a narrow streak at the back of the former, pale yellowish or testaceous; the ♂ has the under side of the antennæ and the intermediate and posterior tarsi also pale. All the markings in the ♂ are brighter and paler than in the ♀. Head finely and deeply punctured, surface very finely rugose; mandibles with long hairs on their outer margin; clypeus bidentate; ♂ with the face below the antennæ covered with shining silvery hairs; thorax not so wide as the head, shallowly and irregularly punctured, surface like that of the head; division between the mesothorax and scutellum simple; metathorax largely rugose, somewhat clathrate at the base, more or less hairy at the sides; abdomen finely punctured, and covered with very short grey hairs; apical segment in the ♀ much more largely and strongly punctured than the rest, its sides carinated; 6th segment in the ♂ with a series of bristly hairs on its apical margin;

tibiæ irregularly denticulate in the ♀, in the ♂ with spinose hairs.

Length 4—6 mill.

Common, generally in sandy banks, &c.

2. *luperus*, Shuck. Foss. Hym. p. 186.

Differs from the above in the ♂ by having the mandibles black, with only the apex reddish, the antennæ entirely black, and the head and thorax more strongly punctured.

♀ differs from *minutus* in the black mandibles and the dark tegulæ and tubercles, the rather more shining thorax, the much more sparsely punctured 2nd segment of the abdomen, the more acute apical segment, and the almost black legs.

Length 5—7 mill.

Hab.—Widely distributed; Southwold, near Reigate, Hayling Island, &c.

3. *tristis*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 78.

Larger than either of the preceding, and differing in having the division between the mesothorax and the scutellum consute. The head and thorax in the ♂ are closely and rugosely punctured; the tegulæ in front and the tubercles pale; metathorax very rugose, pilose at the sides; abdomen finely punctured, and with a scattered short grey pubescence; anterior tibiæ in front, the tarsi and the base of all the tibiæ, pale yellow.

♀ almost as large as *Cemonus unicolor*, entirely black, except the calcaria, and sometimes a piceous spot at the base of the tibiæ, and the basal joints of the tarsi, which are generally more or less piceous; head rather strongly punctured; thorax with scattered punctures and very irregular longitudinal striæ; the division between the mesothorax and scutellum very strongly consute; abdomen very finely punctured, and with short grey hairs, apical segment strongly and largely punctured, and occasionally somewhat piceous.

Length 6—8 mill.

Hab.—Common generally.

PASSALÆCUS, Shuck. (Pl. VIII. fig. 26).

Foss. Hymen. p. 188.

This genus resembles *Diodontus* in general appearance, but has the abdomen more elongate and cylindrical, the

labrum produced into a simple point, and the posterior tibiæ simple.

- (4) 1. Mesopleuræ with two horizontal crenate lines at right angles to the perpendicular one.
 (3) 2. Face with a spine between the antennæ *cornigera*.
 (2) 3. Face without a spine *insignis*.
 (1) 4. Mesopleuræ with only one horizontal crenate line at right angles to the perpendicular one.
 (6) 5. Labrum black *gracilis*.
 (5) 6. Labrum white.. *monilicornis*.

1. *cornigera*, Shuck. ♀ nec ♂. Foss. Hym. p. 191 = *insignis*, Shuck. ♂ nec ♀.

Black; ♂ with the tubercles and tegulæ pale; the mandibles, palpi, and basal joint of the antennæ in front flavous; the tibiæ, tarsi, and extreme apex of the femora testaceous, the posterior tibiæ with a dark cloud across the middle. ♀ resembling the ♂, but having the mandibles, &c., pitchy brown instead of flavous. Head and thorax finely punctured, more or less shining, the former nearly square on the vertex, face below the antennæ silvery, between the antennæ armed with a sharp spine in both sexes, first joint of antennæ large and conical; thorax very closely punctured, in front with two impressed longitudinal lines, extending not quite to the centre of the mesothorax, and with two smooth, slightly raised lines between them; the sides of the mesothorax are margined by a consute impression, and they have a longitudinal impressed straight line on their disk; there is also a consute impression between the mesothorax and scutellum; sides of the mesothorax below the wings with two longitudinal consute impressions, united in front by a transverse one; metathorax elongate and clathrately rugose; abdomen finely and rather closely punctured, the posterior margins of the segments narrowly red; apical segment in the ♂ with an upturned curved process.

Length 6—7 mill.

Hab.—London district, &c.; not rare.

I have followed Thomson and other continental authors in considering the ♂ and ♀ with frontal spines as sexes of the same species. On what grounds our English hymenopterists, Shuckard and Smith, separated them, I

do not know, but the puncturation and other characters of the sexes with the spines are so similar that I feel no doubt that the continental authors are right in their views.

2. *insignis*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 81 = *cornigera*, ♂, Shuck.; *insignis*, ♀, Shuck.

Differs from the preceding in being less elongate, and in having the face without a frontal spine in either sex. The thorax is much more rugosely punctured, and the parallel impressed lines in front strongly reticulated, especially in the ♂; the posterior margin of the mesothorax is also slightly wrinkled or crenate within the reflexed edge in the ♀, strongly so in the ♂; the colour is almost identical in the two species, except that the mandibles in the ♂ of this are often entirely black.

Length 6—7 mill.

Hab.—Widely distributed, and not rare; London district, Hastings, Hayling Island.

3. *gracilis*, Curt. Brit. Ent. xi. pl. 496.

Like the two preceding in general appearance, but distinguishable at once by the sides of the thorax below the wings, having only one transverse consute line instead of two; the puncturation of the thorax is more like that of *cornigera*, and the surface of the thorax somewhat shining, the tubercles black.

Length 6—7 mill.

Hab.—Generally distributed and common.

4. *monilicornis*, Dbm. Hym. Eur. 1, p. 243, 143.

Larger than *gracilis*, and with a wider mesothorax, distinguishable also by the pale tubercles and the white labrum, and the much wider 2nd submarginal cell of the wings, also in having the 2nd segment of the abdomen not constricted at the base; from the other species it differs in the single transverse consute line on the sides of the thorax below the wings.

Length 8 mill.

Hab.—Chobham; Wallholme, E. Cumberland, Bold; Dorsetshire, Dale; Gloucestershire, V. Perkins.

PEMPHREDON, Latr. (Pl. VIII. fig. 27).

Hist. Nat. vol. xiii. p. 325.

= *Cemonus*, Jur.

This genus contains three of our commonest British species; they are much larger than any of the preceding, and may be easily recognised by the hairy head and thorax; the vertex of the head in the ♀ is very large and square, in the ♂ the sides of the head behind the eyes converge considerably; the abdomen has a long petiole, and the posterior tibiæ are more or less irregularly spinose.

- (4) 1. 1st submarginal cell receiving both recurrent nerves.
 (3) 2. Smooth space on the metathorax narrowly lunulate, its posterior margin well defined *unicolor*
 (2) 3. Smooth space on the metathorax widely lunulate, its posterior margin not defined *lethifer*.
 (1) 4. 1st and 2nd submarginal cells each receiving a recurrent nervure *lugubris*.

1. *lugubris*, Fab. Ent. Syst. ii. p. 302 = *luctuosus*, Shuck. Fig. Panz. Faun. Germ. 52, 24 (*unicolor*).

Entirely black; head rugosely punctured, and covered with long hairs; vertex with its sides converging towards the base in the ♂, quadrate in the ♀; mesothorax and scutellum rugosely punctured and hairy; metathorax rugose and covered with long hairs, with a semicircularly raised brow, which is not so coarsely rugose as the rest of the surface; petiole of the abdomen looked at from the side curved, above rugose, with long hairs above and beneath, rest of the abdomen shining, with long hairs at the base and apex, and on the under side; femora densely covered with hairs; tibiæ in the ♀ with irregular and occasional spines externally, densely covered on the side towards the body with short adpressed hairs.

Length 9—12 mill.

Hab.—Very common and generally distributed.

Var. *luctuosa*, Shuck., is a var. of the ♂ with the raised portion of the metathorax more or less shining and smooth.

2. *unicolor*, Latr. Gen. Crust. et Ins. iv. p. 84.
Fig. Smith Brit. Foss. Hym. pl. iv. fig. 3.

Usually smaller than *lugubris*, and differing from it in the characters of the wing-cells, as shown in the analytical table above; it has also the head and thorax largely but less rugosely punctured; the metathorax with a broad shining, slightly raised, semicircular smooth space below the base, which is well defined on both its edges; the abdomen also is distinctly punctured in both sexes.

Length 6—10 mill.

Hab.—Very common everywhere.

3. *lethifer*, Shuck. Foss. Hym. p. 201.

Differs from the above, only as far as I can see, by the wider smooth space on the metathorax, which is well defined on its upper margin, but not on its lower; the smooth space in *unicolor* rises up distinctly from the surrounding rugosities, whereas in *lethifer* the rugosities seem to diminish as they approach the lower margin of the space till the surface becomes merely punctured.

Hab.—Equally common as the last; may be bred freely from bramble stems.

CERATOPHORUS, Shuck. (Pl. VIII. fig. 28).

Foss. Hym. p. 195.

This genus is considered as a section of *Pemphredon* by Thomson, but it appears to me to be sufficiently well characterised to maintain; the clypeus is deeply and squarely notched, and the face between the antennæ has a short blunt process like a broken-off spine, its apex slightly emarginate; the face below the antennæ in the ♂ is not silvery, as in nearly all the genera of this family; the petiole of the abdomen in both sexes is shorter than in *Pemphredon*, and the posterior tibiæ without spines.

1. *morio*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 84.
Var. = *anthracinus*, Sm.

Entirely black; head rugosely punctured, covered with erect paler hairs; face, on each side, between the antennæ

and eyes, somewhat angularly raised, excavated between the projections, and in the middle of the excavation, just above the insertion of the antennæ, is a short blunt spine, having its apical margin emarginate; thorax covered with pale hairs; mesothorax and scutellum shining, largely and remotely punctured; metathorax rugose, brow shining and elevated, as in *Pemphredon unicolor*; abdomen shining, finely and remotely punctured, with the petiole short and rugose, not nearly so long as the rest of the segment, more or less hairy on the 3rd and following segments, apical segment in the ♀ very largely punctured, its margins slightly raised; beneath in the ♂ with a thick fringe of hairs across the middle of the 3rd, 4th, and 5th segments; tibiæ simple, without lateral spines; femora hairy beneath.

Length 6—7 mill.

Hab.—London district; rare.

MIMESIDÆ.

- (2) 1. 2nd submarginal cell receiving both recurrent nervures *Mimesa*.
 (1) 2. 2nd and 3rd submarginal cells each receiving a recurrent nervure *Psen*.

MIMESA, *Shuck.* (Pl. VIII. fig. 29).

Foss. Hymen. p. 228.

A genus which resembles *Pemphredon*, of the last family, very much in form, but differing in having three submarginal cells; from *Psen* the arrangement of the recurrent nervures distinguishes it, as shown in the table above. The form of the petiole is the chief specific characteristic among the members of this genus.

- (6) 1. Body red at the base.
 (3) 2. Petiole of the body flat, widening posteriorly; 3rd segment of body in ♀ entirely black *Shuckardi*.
 (2) 3. Petiole of the body narrow and not widened posteriorly; 3rd segment in ♀ more or less red.
 (5) 4. Mesopleuræ not punctured *bicolor*.
 (4) 5. Mesopleuræ strongly punctured *equestris*.
 (1) 6. Body entirely black.
 (8) 7. Petiole carinated, not widening at the apex; carina not grooved *unicolor*.
 (7) 8. Petiole widened at the apex, carina grooved *Dahlbomi*.

1. *Shuckardi*, Wesm. Hym. Foss. Belg. 115, 5 = *equestris*, Shuck. (nec Fab. ?), Foss. Hym. p. 229. Smith, &c.

Black, with the two basal segments of the abdomen red, except the actual petiole, and usually a black spot on the disk of the 1st segment; antennæ beneath and apical joints of the tarsi fulvous. Head very finely and closely punctured, face in front of the antennæ covered with bright silvery hairs; thorax covered with very short pale hairs, punctured, but not so closely as the head; mesothorax with an impressed line on each side in front; metathorax longitudinally rugose at the base, deeply channelled behind, and irregularly and somewhat clathrately rugose at the sides, the sides also covered with silvery hairs; abdomen finely punctured, petiole wide, flat, and hairy above, widening towards the apex, apical segment in the ♂ with an upcurved process, in the ♀ hairy and deeply punctured and carinated at the sides; sides of the segments with a short adpressed silvery pubescence, especially towards their apex; tibiæ with short spines.

Length 9—12 mill.

Hab.—Hampstead, Yorkshire, Isle of Wight, and Sandhurst; also at Lowestoft.

2. *bicolor*, Jur. Hym. pl. xiii.

Very like the above, but distinguishable at once by the narrow carinated petiole, the almost impunctate body, the red 3rd segment (at least at the base), and the red colour of the tibiæ and tarsi, which are only clouded with black in the middle.

Length 7—9 mill.

Hab.—Hampstead Heath, Blackheath, &c.

3. *equestris*, Fab. (nec Shuck.) Syst. Piez. p. 182.

Extremely like *bicolor*, but has the mesothorax more strongly punctured, the sides of the mesothorax below the wings deeply and distinctly punctured, whereas in *bicolor* their puncturation is hardly visible, and the petiole of the body shorter and less distinctly carinated.

Hab.—Southwold, Chobham, &c.

4. *unicolor*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 107.

Entirely black, except the pale calcaria and apices of the tarsi; and, besides the colour, differing from any of the preceding in having no tubercle between the antennæ, and no transverse carina on the clypeus, but a narrow raised line runs from the central ocellus to between the antennæ; petiole of the body with a smooth, raised central carina; the ♂ differs further in having the 7th segment of the body clearly visible from above.

Length 7—8 mill.

Hab.—Generally distributed. “Entering the straws of a thatched outhouse, Charlton, Kent,” Smith.

5. *Dahlbomi*, Wesm. Hym. Foss. Belg. p. 108.

Like *unicolor* in colour, but easily distinguished by the sculpture of the petiole; in this species the petiole is flat, gradually widening to the apex, and bears two raised lines which unite at the apex, making a sort of lanceolate inclosure; the apical segment of the body in the ♀ is also very different, in *unicolor* it is widely flattened above, dull, and largely and closely punctured; in this species it is shining, narrowly flattened, with a carina on each side, and a slightly raised line in the middle, punctured between the elevations; the ♂ differs also in having a raised line on the under side of the 9th and 10th joints of the antennæ.

Length 7—9 mill.

Hab.—Chobham, &c.

PSÉN, *Latr.* (Pl. VIII. fig. 30).

Préc. Caract. Gen. Ins. p. 122.

Very like *Mimesa*, and differing from it in having each submarginal cell receiving a recurrent nervure.

- (?) 1. Larger, petiole nearly twice as long as the rest of the 1st segment *ater*.
 (1) 2. Smaller, petiole scarcely longer than the rest of the 1st segment *pallipes*.

1. *ater*, Fabr. Ent. Syst. Suppl. 244, 18. Fig. Jurine, Nouv. Meth. Hym. pl. viii. 6 (*serraticornis*).

Black, shining; ♂ with the antennæ, mandibles, palpi,

anterior and intermediate legs beneath, except the femora and also the posterior tarsi, more or less fulvous. Head punctured, finely pilose, face densely covered with golden hairs, and with a short spine between the antennæ; antennæ in the ♂ with the scape very much dilated, flagellum compressed and dilated, the 8th to 10th joints excavated beneath and serrated; thorax finely pilose; mesothorax and scutellum punctured; wings slightly dusky; metathorax clathrately rugose, with a well-defined triangular basal area, which is longitudinally rugose; abdomen with the petiole long, (looked at sideways) curved, smooth, and somewhat flattened above, with a few long pilose hairs beneath, the rest of the abdomen finely punctured; apical segment in the ♀ very largely punctured and carinated at the sides; posterior tibiæ serrate; ♂ with the two basal joints of the intermediate tarsi produced at the sides.

Length 10 mill.

Hab.—Hawley, Hants; Lowestoft. Very rare.

2. *pallipes*, Panz. Faun. Germ. lii. 22 = *atratus*, Panz., Shuck., &c.

Much smaller than *ater*, black, with the antennæ beneath, anterior tarsi, and the anterior tibiæ in front testaceous in both sexes; the ♂ has also the intermediate tarsi pale; head closely and rugosely punctured, face below the antennæ covered with silvery hairs; between the antennæ is a well-marked carina, wide posteriorly, and sharpened anteriorly where it joins the carinated margin of the large antennal cavities; antennæ in ♀ short and somewhat thickened towards the apex; thorax largely punctured, more or less covered with rather short white hairs; wings hyaline; metathorax clathrately rugose, deeply and widely sulcate down the middle; abdomen shining, covered with short grey-white hairs, especially towards the apex; apical segment in the ♀ not more strongly punctured than the others; legs covered with short, fine, adpressed hairs.

Length 6—7 mill.

Very common generally. I have bred it from pierced bramble stems.

NYSSONIDÆ.

- (6) 1. Front wings with only three submarginal cells.
 (3) 2. Front wings with the 2nd submarginal cell not petiolated *Harpactus*.
 (2) 3. Front wings with the 2nd submarginal cell petiolated.
 (5) 4. 1st and 2nd submarginal cells each receiving a recurrent nervure *Didineis*.
 (4) 5. 2nd submarginal cell receiving both recurrent nervures *Nysson*.
 (1) 6. Front wings with four submarginal cells, or at least with the 4th almost complete.
 (10) 7. 2nd submarginal cell receiving both recurrent nervures.
 (9) 8. 4th submarginal cell incomplete; median nerve of hind wing becoming furcate beyond the posterior transverse nerve *Gorytes*.
 (8) 9. 4th submarginal cell complete; median nerve of hind wing becoming furcate before the origin of the posterior transverse nerve *Hoplisus*.
 (7) 10. 1st and 3rd submarginal cells each receiving a recurrent nervure *Mellinus*.

HARPACTUS, *Jur.* (Pl. VIII. fig. 31).

Nouv. Meth. Hym. p. 124, pl. x. 20 = *Arpactus*, Shuck., &c.

I have had great doubts as to the natural position of this genus and of the following, as they are so unlike the rest of the forms with which any structural classification seems to throw them, in colour and general appearance; however, I do not see any better position for them than in the Nyssonidæ, where F. Smith has placed them, and I have accordingly followed his views. *Harpactus* may be known at once from any of the other genera in the family by having only three submarginal cells, and the 2nd not petiolated; the abdomen shining, and red at the base.

1. *tumidus*, Panz. Faun. Germ. 81, 15.

Head and thorax black; scape of the antennæ, clypeus, and a spot on each side of the face, white; scutellum generally with a white central spot; antennæ in the ♂ more or less piceous; abdomen with the two basal segments red, a small white spot at the side of the apical margin of the 2nd segment, and a white spot on the 5th at the base in the ♀, or a white transverse line at its apex in the ♂; the 6th in the ♂ sometimes with a pale central line; these spots are all more or less liable to disappear;

anterior and intermediate legs testaceous; the femora above, the tarsi and the apex of the intermediate tibiæ, fuscous, or in some nearly black; posterior legs black, with only the base of the tibiæ paler; head and thorax rather thickly clothed with short adpressed golden hairs, and covered with large scattered punctures; wings hyaline, nervures and tegulæ testaceous; metathorax with a well-defined triangular basal area, carinated in the middle, the margins of the area outside are radiately striate, the sides of the metathorax are covered with short whitish hairs; abdomen irregularly punctured; apical segment in ♀ with very large coarse punctures; tibiæ with a few spinose hairs.

Length 8—9 mill.

Hab.—Sandy places in summer; Deal, Lowestoft, Southwold, Erith, Hampstead, &c.

DIDINEIS, *Wesm.* (Pl. VIII. fig. 32).

Bull. Acad. Roy. Belg. xviii. No. 10.

= *Alyson*, Shuck.

Somewhat like *Harpactus* in form, but more slender, the metathorax longer and truncate at the apex, with prominent angles, the 2nd submarginal cell petiolated, and the apical joint of the antennæ in the ♂ shaped like a crescent.

1. *unicornis*, Fab. Ent. Syst. Suppl. p. 249. Fig. Smith Brit. Foss. Hym. pl. iv. fig. 5, ♂. Curtis Brit. Ent. xiii. 584, ♀ = *Kennedii*, Curt.

Mandibles pale, with the apex piceous; antennæ piceous beneath; black, basal segment of the abdomen and the base of the 2nd in the ♂ and the two basal segments and the base of the 3rd in the ♀ red; wings with a brown band near the apex, covering the radial, 2nd submarginal, and part of the 3rd discoidal cell; legs piceous; head shining and very finely punctured in the ♂, dull and more coarsely so in the ♀; apical joint of the antennæ in the ♂ falcate; thorax very closely punctured; metathorax parallel-sided, with a lanceolate enclosure at the base, bounded by an elevated ridge, irregularly rugose within, radiately rugose outside, with a short dentate spine near the apex on each side; abdomen shining, finely punctured, 3rd and following

segments with irregular erect hairs; apical segment in the ♂ with a delicate spine at each side; under side of all the segments, except the basal one, with long pilose hairs.

Length 7—9 mill.

Hab.—Worthing; Hastings; Ryde; Bristol; Lyme Regis. Rare.

Nysson, *Latr.* (Pl. VIII. fig. 33).

Prec. Charact. Gen. Ins. p. 125.

A genus which may easily be determined by the square metathorax, truncate at the apex, and spined at the posterior angles. The wings have three submarginal cells, the 2nd petiolated; the abdomen is black, banded or spotted with yellow at the sides, the base in some species more or less red.

- (4) 1. Anal cell of hind wings terminating considerably before the origin of the cubital nerve; 1st segment of body much narrower than 2nd. (Pl. VIII. fig. 34).
- (3) 2. Tubercles of thorax black *spinus*.
- (2) 3. Tubercles of thorax yellow *interruptus*.
- (1) 4. Anal cell of hind wings terminating at or beyond the origin of the cubital nerve; first joint of body as wide or wider than 2nd. (Pl. VIII. fig. 35).
- (6) 5. Larger, thorax very rugose, with a yellow line in front; basal segment of the body very rarely red *3-maculatus*.
- (5) 6. Smaller, thorax only rugosely punctured, without a pale line in front; basal segment of body always brownish red *dimidiatus*.

1. *spinus*, Fab. *Syst. Ent.* p. 373. Fig. Panz. *Faun. Germ.* 62, 15. (Pl. VIII. fig. 34).

Black, a band across the prothorax, often wanting in the ♂, and a band at the apex of the 1st, 2nd, and 3rd abdominal segments in the ♂, a spot on each side of the 1st segment in the ♀, and an interrupted band on the 2nd and 3rd, yellow; tubercles black; tegulæ pitchy; wings clouded; legs in the ♂ black, with the extreme apex of the femora, base and apex of the tibiæ, and tarsi red; legs in the ♀ red, with the femora more or less black at the base. Head and thorax very rugosely punctured, densely covered with short ochreous hairs in the ♂, sparsely so in the ♀; post-scutellum and metathorax clathrate, the latter hairy at its sides, especially in the ♂, and armed on each side with a short thick

spine ; abdomen dull in the ♂ , more or less shining in ♀ , 1st segment very largely and coarsely punctured, the rest more finely so ; apex of the abdomen in the ♂ bidentate ; basal segment above and all the segments beneath densely clothed with silvery hairs in the ♂ ; legs finely pubescent.

Length 10—12 mill.

Hab.—Widely distributed, and often common.

2. *interruptus*, Fab. Ent. Syst. Suppl. p. 266. Fig. Panz. Faun. Germ. 77, 18 (*dissectus*).

Very like the preceding, but shorter and more compact, and has the antennæ only a little longer than the head, and the tubercles yellow.

Length 8—9 mill.

Hab.—Hampstead and Highgate, and London district.

3. *trimaculatus*, Rossi. Faun. Etrusc. ii. p. 95. (Pl. VIII. fig. 35).

Shorter and broader than either of the above ; thorax with a line at the base of the prothorax, and the tubercles yellow ; scutellum sometimes with a yellow line ; abdomen with a yellow spot at the side of the 1st, 2nd, and 3rd segments ; legs black, knees and apex of tibiæ narrowly brown. Head and thorax largely and rugosely punctured, and covered with short whitish hairs ; basal area of metathorax shining, with a series of parallel ridges ; abdomen shining, largely and remotely punctured, especially on the basal segment, the puncturation becoming finer towards the apical segment, which is very finely and closely punctured ; penultimate joint of the antennæ in the ♂ much larger than the apical joint, which is sinuate and excavated beneath.

♀ varies occasionally in having the base of the abdomen red.

Length 8—9 mill.

Hab.—Rare ; Battersea, Southgate, Weybridge, &c. F. Smith says :—"I have most frequently captured this insect when beating bushes for Coleoptera ; it mimics death in the same way as *Hedychrum* and *Chrysis*."

4. *dimidiatus*, Jurine. Hym. pl. x. f. 22 = *guttatus*, Shuck.

Smaller than any of the above. Thorax with the tubercles only pale; abdomen with the basal segment and the base of the 2nd brownish red, sometimes the 2nd segment of this colour all over, 2nd and 3rd segments with a pale spot on each side; tibiæ and tarsi brown. Head and thorax rugosely punctured; apical joint of the antennæ in the ♂ twice as long as the penultimate, and bisinuate beneath; abdomen dull, with scattered, shallow, punctures, beneath with the ventral prominence almost obsolete.

Length 7 mill.

This very distinct little species is rare, but has occurred at Hastings, Littlehampton, Hampstead, Highgate, Weybridge, Southend, and Deal. July and August.

GORYTES, *Latr.* (Plate VIII. figs. 36 and 37).

Hist. Nat. vol. xiii. p. 308.

Like *Nysson* in coloration, but has the 2nd submarginal cell simple, and the 4th almost completed. The metathorax rounded posteriorly.

- (2) 1. ♂ antennæ longer; tibiæ more or less black; ♀ basal joint of abdomen much narrower than 2nd, with only two spots *mystaceus*.
 (1) 2. ♂ antennæ shorter; tibiæ entirely yellow; ♀ basal joint of abdomen not much narrower than 2nd, with a complete yellow apical band *campestris*.

1. *mystaceus*, Linn. Faun. Suec. ed. ii. p. 412. Fig. Panz. Faun. Germ. 53, 11, ♀. (Plate VIII. fig. 37).

Black, two spots at the base of the clypeus, a band at the base of the prothorax, the tubercles, the scutellum in the ♀, an interrupted band on the basal segment of the abdomen, and an entire band on the 2nd and 3rd, and occasionally a spot on the 4th, yellow. Tibiæ in the ♂ outwardly yellow; tarsi fuscous, paler at the base; tibiæ and tarsi in the ♀ entirely fulvous. Head and thorax deeply and closely punctured, covered with greyish hairs; face below the antennæ in the ♂ with silvery hairs; antennæ in the ♂ very long, reaching to about the middle of the 2nd abdominal segment; basal area of the metathorax longitudinally ridged, with a deep central furrow,

sides clathrate; front wings slightly clouded at their base and upper margin; basal segment of the abdomen covered with longer hairs than the rest, rugosely punctured, especially at the base, where it is also rugosely striated, 2nd segment at the apex much wider than the first, puncturation finer and more regular, 3rd and following more finely punctured again; ♀ beneath with the 1st and 2nd segments dull, covered with a short brownish grey, adpressed pubescence, the 2nd largely punctured near the base, rest shining, punctured; ♂ beneath rugosely punctured.

Length 12—15 mill.

Hab.—Not uncommon during the summer, and generally distributed.

2. *campestris*, Linn. Faun. Suec. 2nd ed. p. 417. Fig. Panz. Faun. Germ. 98, 17 = *Fargeii*, Shuck. Foss. Hym. p. 214.

Differs from the preceding in having the antennæ in the ♂ distinctly shorter, and the clypeus nearly entirely yellow; the basal segment of the abdomen is wider, and there is a yellow band also on the 4th segment; the tibiæ and tarsi are entirely pale yellow.

The ♀ differs in having four wider abdominal bands, the tibiæ and tarsi yellower, and the 2nd segment of the abdomen beneath with only a few small punctures at the base.

Length 9—11 mill.

Hab.—Highgate, Wandsworth, Lowestoft, &c.; end of June, &c.

HOPLISUS, Lep. (Pl. VIII. figs. 38 and 39).

Ann. Soc. Ent. Franc. vol. i. p. 62.

Differs from the preceding genus in having a complete 4th submarginal cell, and in the neuration of the hind wings, as shown in the table of the Nyssonidæ. Smith has considered this genus as a part of *Gorytes*, but all the continental authors keep it distinct, and the difference in the neuration of the wings seems to me to be a quite sufficient cause of separation.

- (4) 1. Basal segment of abdomen not constricted at the apex, its sides gradually diverging in nearly straight lines.
 (3) 2. Band of the 2nd segment of the abdomen not wider than that of the 1st ±-fasciatus.

- (2) 3. Band of the 2nd segment of the abdomen much wider than that of the 1st *laticinctus*.
 (1) 4. Basal segment of abdomen constricted at the apex, its sides much rounded *bicinctus*.

1. *quadrifasciatus*, Fabr. Syst. Piez. p. 298. Fig. Curt. Brit. Ent. xi. 524 (*libinitarius*). (Pl. VIII. fig. 39).

Black; clypeus of the ♂ widely yellow at the base, labrum with two yellow spots; clypeus of the ♀ with three pale spots, sometimes united, labrum unspotted, a spot on the margin of each eye, and the scape of the antennæ in front, yellow in both sexes, the basal joints of the flagellum rufescent in the ♀; prothorax with a yellow basal line; wings with the nervures pale brown, slightly tinged with brown, and having a brown cloud across the radial and 2nd and 3rd submarginal cells; scutellum with a pale apical line in the ♀; abdomen in both sexes with four yellow bands, the 2nd band not wider than the basal one; femora with the apices pale; ♀ with the tibiæ and tarsi entirely testaceous; ♂ tibiæ testaceous in front, posteriorly black, except at the base; tarsi testaceous, posterior pair fuscous towards the apex; head more or less hairy on the vertex, very finely punctured; mesothorax exceedingly finely punctured; metathorax with its basal area irregularly and longitudinally rugose, outside the basal area somewhat clathrate; abdomen shining, very finely punctured, basal segment not constricted at the apex; tibiæ with pale spines.

Length 11—12 mill.

Hab.—In woody places; generally distributed.

2. *laticinctus*, St. Farg. Ann. Ent. Fr. i. p. 66. Fig. St. Farg. Hym. pl. xxv. fig. 6.

Very like the preceding, but rather larger; the antennæ in the ♂ rather longer, the clypeus in the ♀ entirely yellow, the sides of the face with a broad yellow spot, and the antennæ beneath pale almost to the apex; basal area of the metathorax clathrate in both sexes, and the 2nd abdominal band much wider than the basal one, occupying not quite the whole apical half of the segment; tibiæ in the ♀ posteriorly, black near the apex.

Length 12—13 mill.

Hab.—Rare; New Forest.

3. *bicinctus*, Rossi. Faun. Etrusc. App. p. 123. Fig. Smith Brit. Foss. Hym. pl. iv. fig. 6. Curtis Brit. Ent. xi. 524.

Like the preceding species in general colour, but very different in form, sculpture, &c. Head and thorax dull and distinctly and closely punctured; basal area of the metathorax finely striate, with a distinct central sulcature, sides rugosely punctured; abdomen with two spots on the basal segment, a wide band on the 2nd, and a narrow one on the 3rd, yellow; basal segment not nearly half so wide as the 2nd, its sides rounded, and converging again towards the apex, 2nd segment, at its extreme base, with a series of very short striae.

Length 11 mill.

Hab.—New Forest, Hastings, London district?

MELLINUS, *Fab.* (Pl. VIII. fig. 40, 41).

Ent. Syst. ii. p. 285.

The elongate form, petiolated abdomen, and shining surface will distinguish the members of this genus from their allies; the neururation of the upper wings is very peculiar, as the recurrent nervures are received, one at the apex of the 1st submarginal cell, the other at the base of the 3rd.

- (2) 1. Markings yellow; tibiae and tarsi yellow; ♂ antennæ simple *arvensis*.
 (1) 2. Markings white; tibiae and tarsi reddish: ♂ antennæ with joints 8—11 beneath, produced, and sub-tuberculated *sabulosus*.

1. *arvensis*, Linn. Syst. Nat. ed. x. vol. i. p. 573. Fig. Panz. Faun. Germ. 17, 20 (*U. flarum*).

Black; the base of the clypeus in the ♂, the scape of the antennæ in front and a line on each side of the face, the raised posterior margin of the prothorax, the tegulae and a spot under each wing, and the scutellum, yellow in both sexes; abdomen in the ♂ with a central, usually interrupted, band on the 3rd segment, a spot on the 6th, and sometimes indications of bands on the 2nd, 4th, and 7th segments, yellow; ♀ with a spot on each side of the basal segment, a very wide band on the 2nd and 3rd, an interrupted band on the 4th, and nearly the whole of the

5th segment yellow, the band on the 4th segment sometimes continuous; legs yellow; the base of the femora black. Head and thorax finely, closely, and rugosely punctured, especially in the ♀; face below the antennæ covered with long testaceous hairs; antennæ simple in both sexes; metathoracic basal area somewhat smooth, depressed in the middle, and rugose, bounded by a narrow consute line, sides finely hairy and rugose; body shining, with obsolete, scattered punctures on the 1st, 2nd, and 3rd segments, more closely punctured on the following, petiole hairy; apical segment in the ♀ finely striate, with a few large punctures near the base; 5th and 6th segments in the ♀ and 7th in the ♂ more or less hairy; abdomen beneath with scattered hairs; tibiæ with pale spines.

Length, ♂ 8—11 mill., ♀ 13—15 mill.

Hab.—Common in many places, and generally distributed.

2. *sabulosus*, Fabr. Mant. Ins. i. p. 296. Fig. Smith Brit. Foss. Hym. pl. iv. fig. 4.

Rather smaller than the above, with the head and thorax less closely punctured; markings white instead of yellow; 2nd and 3rd segments of the abdomen each with a large transverse white spot on each side, the upper one in the ♂ often obsolete, a white band on the 5th segment in the ♀ and a spot on the 6th segment in the ♂ also white; legs fulvous, not yellow, as in *arvensis*; antennæ fulvous, except at the base above; ♀ with joints 8—11, produced beneath, and subtuberculate, their lower margin dentate at the apex.

Length, ♂ 8—9 mill., ♀ 12—13 mill.

Hab.—Generally distributed; Suffolk, Hants, Nottingham, Newcastle; sometimes very common.

CERCERIDÆ.

- | | | | |
|--|----|----|------------------------|
| (2) 1. 2nd submarginal cell petiolated | .. | .. | .. <i>Cerceris</i> . |
| (1) 2. 2nd submarginal cell not petiolated | .. | .. | .. <i>Philanthus</i> . |

CERCERIS, Latr. (Pl. VIII. fig. 42).

Hist. Nat. Ins. xiii. p. 315.

This is one of the most distinct genera of the Fossorial Hymenoptera; the 1st segment of the abdomen is narrower than the rest, being little more than half the

width of the 2nd, and all the segments are constricted at the base and apex, the surface is deeply punctured, the apical constriction of each segment shining and impunctate; the abdomen in all the species is banded with black and yellow, and the front wings have the 2nd submarginal cell petiolated.

- (2) 1. Basal triangle of metathorax smooth and shining *ornata*.
 (1) 2. Basal triangle of metathorax striated.
 (4) 3. 2nd or 3rd segment entirely pale, without a black basal band *sabulosa*
 (3) 4. All the segments banded.
 (8) 5. Clypeus of ♂ more or less toothed in front; clypeus of ♀ not emarginate.
 (7) 6. Larger, penultimate segment of abdomen in the ♂ without a pencil of rigid setæ at the sides; clypeus of ♀ not raised *arenaria*.
 (6) 7. Smaller, penultimate segment of abdomen in the ♂ with a pencil of rigid setæ on each side; clypeus of ♀ raised *labiata*.
 (5) 8. Clypeus of ♂ not toothed; of ♀ emarginate .. *5-fasciata*.

1. *arenaria*, Linn. Syst. Nat. ed. x. vol. i. p. 571. Fig. Smith Brit. Foss. Hym. pl. iv. fig. 8.

Black, with the following parts yellow, viz., entire face in the ♂ and scape of the antennæ in front; a spot on the clypeus and one on each side of the face in the ♀ and a spot behind each eye; a spot on each side of the prothorax, the tegulae, and the post-scutellum in both sexes, and a spot on each side of the metathorax in the ♀; a band at the apex of each abdominal segment, except the apical one in the ♀, and of each, except the basal and apical ones, in the ♂; legs in the ♂, except the upper side of the femora of the anterior and intermediate pairs, and the apex of the femora of the posterior pair, and a spot at the apex of the posterior tibiæ within. Legs in the ♀ reddish, the two front pairs of femora black at the base, the posterior pair black above; under side of the ♂ with a yellow spot on each side of the 3rd and 4th segments of the abdomen; the ♂ has also sometimes a small round spot on each side of the basal segment of the body above; apical joint of the antennæ reddish, and generally the 2nd and 3rd in both sexes; wing nervures orange-brown. Head and thorax largely and coarsely punctured, rather densely hairy in the ♂, sparingly in the ♀; clypeus in the ♂ tridentate, with a

thick fringe of bristles on each side near the eye, clypeus in the ♀ rounded in front; metathorax rugose in both sexes, its basal area longitudinally striate; abdomen strongly punctured, basal segment covered with long hairs; all the segments in the ♂ more or less hairy; apical segment flattened above, and largely punctured in the ♂, transversely rugose in the ♀, carinated on each side, and somewhat rounded at the apex, with a slight projection on each side; under side of all the segments in the ♂ with an apical fringe, and a few scattered hairs on the disk, in the ♀ almost naked.

Length 12—16 mill.

Hab.—Common in sandy places.

2. *5-fasciata*, Rossi. Faun. Etrusc. Mant. i. p. 139. Fig. Panz. Faun. Germ. 63, 12, ♂, 63, 17, ♀ (*interruptus*) = *interrupta*, Shuck.

Very like *arenaria*, but smaller, the puncturation of the thorax larger and more remote, and the pubescence less dense in the ♂; the clypeus in the ♂ simply truncate at the apex, and not obsoletely tridentate as in *arenaria*, that of the ♀ slightly raised (but not free), deeply and semicircularly emarginate in front; basal segment of the abdomen in the ♀ less hairy, and with only a very small reddish yellow spot on each side; apical segment rather narrower at the apex, the fringe of hairs on its lateral carinae longer; penultimate segment of the ♂ with a small tuft of rigid pale setae on each side at the apex; legs in the ♀ fulvous, those of the ♂ dark at the base of the femora of the two front pairs, and with a dark ring near the apex of the posterior pair.

Length 9—11 mill.

Hab.—Southend; Birch Wood; Lowestoft; Southwold, &c.

3. *labiata*, Fabr. Ent. Syst. ii. p. 269. Fig. Panz. Faun. Germ. 63, 16, ♀, 46, 2, ♂ (*arenarius*) ?

Almost exactly like the preceding in colour and size; the 1st segment of the body of the ♀ however has larger and paler yellow spots, and the posterior femora of the ♂ have a wider black apical band; the ♂ may be however separated at once by the 3-dentate clypeus, and the longer hairs of the abdomen beneath, and the ♀ by the

raised and free clypeus, which is truncate in front, and not emarginate as in *5-fasciata*; the ♂ is rather like a small *arenaria*, but differs in having the tuft of rigid setæ on the penultimate segment like the preceding species.

Length 9—11 mill.

Common. Chobham; Southwold; Weybridge; Walmer; Southend, &c.

4. *sabulosa*, Panz. Faun. Germ. 63, 13. Var. = *quadricincta*, Shuck.

Differs from any of the above in having the 2nd and 3rd abdominal segments in the ♂ and the 2nd in the ♀ without the black angular band at the base; the metathorax has a yellow spot on each side in both sexes, and its central area is rugosely striate; the abdomen is dull, and much more strongly and closely punctured than in any of the preceding; apical segment in the ♂ strongly emarginate; antennæ fulvous, paler beneath, the scape yellow; legs entirely pale in the ♂.

Length 9—11 mill.

Hab.—Rare; Faversham; Canterbury.

5. *ornata*, Fab. Ent. Syst. ii. p. 290. Fig. Panz. Faun. Germ. 63, 10.

Very like *sabulosa*, but generally larger, and differs from all the species of the genus in having the basal area of the metathorax smooth, at least on its disk. The 3rd and 5th abdominal segments are generally entirely yellow, but sometimes there is a black spot in the middle of the base of the 2nd; the markings on the other segments are very variable; femora black at the base in both sexes.

Length 10—15 mill.

Hab.—Common, and widely distributed.

PHILANTHUS, *Fabr.* (Pl. VIII. fig. 43).

Ent. Syst. ii. p. 288.

Like *Cerceris* in the coloration, but with the abdomen shorter and more oval; the basal segment scarcely constricted at the apex, and almost as wide as the 2nd; the wings with the 2nd submarginal cell simple.

1. *triangulum*. Fab. Syst. Ent. 372. Fig. Smith Brit. Foss. Hym. pl. v. fig. 1.

Head black; mandibles pitchy brown; clypeus, sides of the face, and a tricuspid spot above the clypeus, and the head behind the vertex pale yellow; thorax black, with the collar and post-scutellum, and sometimes a spot on the scutellum, yellow; abdomen yellow, with a wide triangular band at the base of each segment, except the apical one, black; legs yellow, base of femora black; the size of the triangular bands varies much; in some specimens they are reduced almost to a basal spot, so that the abdomen is almost entirely yellow. Head covered with short hairs, very finely and closely punctured, more coarsely so on the vertex; thorax hairy, like the head; mesothorax coarsely punctured, metathorax very closely and rugosely so; brow of the metathorax sometimes smoother and shining; abdomen deeply punctured, ovate; basal segment hairy above; all the segments beneath with a few scattered hairs; tibiæ and tarsi spinose.

Length 10—15 mill.

Hab.—Local. Hants; Sandown Bay; Pegwell Bay; Byfleet; Epping.

CRABRONIDÆ.

- (2) 1. Neuration of hind wings complete *Trypoxylon*.
 (1) 2. Neuration of hind wings incomplete.
 (6) 3. Submarginal cell not confluent with the 2nd discoidal.
 (5) 4. Eyes hairy *Entomognathus*.
 (4) 5. Eyes naked *Crabro*.
 (3) 6. Submarginal and 2nd discoidal cells confluent .. *Oxybelus*.

TRYPOXYLON, *Latr.* (Pl. VIII. fig. 44).

Proc. Caract. Gen. Ins. p. 121.

The very long clavate abdomen is the chief characteristic of this genus; the neuration of the wings also is different from that of any other genus amongst the Fossorials. The front wings have one distinct submarginal and one distinct discoidal cell, but a second submarginal and a 3rd discoidal are indicated by a series of indistinct nerves which at first sight are scarcely noticeable.

- (2) 1. Petiole very long and thin; 1st joint of abdomen twice or nearly twice as long as the 2nd .. *attenuatum*.
 (1) 2. Petiole shorter and stouter; 1st joint of abdomen not nearly twice as long as the 2nd.
 (4) 3. Larger; antennæ scarcely clavate; legs entirely black *figulus*.
 (3) 4. Smaller; antennæ more or less clavate; knees and tarsi piceous *clavicerum*.

1. *figulus*, Linn. Syst. Nat. ed. x. vol. i. p. 570. Fig. Panz. Faun. Germ. 80, 16.

Black; apex of the mandibles red. Head and thorax dull, very finely and closely punctured, covered with very short greyish hairs; antennæ scarcely thickened at the apex; scutellum less closely punctured and somewhat shining; metathorax radiately rugose at the base, shallowly channelled down the middle, covered with short silvery hairs, transversely striate at its sides; wings with a slight apical cloud; abdomen covered with exceedingly short grey hairs; the apex of each segment, especially in the ♂, with a greyish band, widest at the sides; this is very liable to be rubbed off in old specimens; basal joint of abdomen not quite once and a half as long as the 2nd; apical segment in the ♀ with long bristly hairs; legs finely clothed with greyish hairs, their sides towards the body with a shining, sericeous pubescence.

Length 12—13 mill.

Very common, and generally distributed; appears in June.

2. *clavicerum*, St. Farg. Enc. Meth. x. p. 750.

Smaller than *figulus*, and easily distinguished by the shorter clavate antennæ, especially in the ♂, the apical joint being little longer than wide, the much more prominent forehead between the eyes, and the pale tegulæ and pale knees, and occasionally more or less pale tibiæ.

Length 6—8 mill.

Hab.—Common, and generally distributed.

3. *attenuatum*, Sm. Cat. Brit. Hym. App. p. 120. Fig. Smith Brit. Foss. Hym. pl. iv. fig. 2.

Narrower than either of the preceding, and at once distinguishable by the long thin 1st segment of the abdomen, which is twice as long as the 2nd; the joints are altogether more slender, being as long as or longer than

wide. The puncturation of the thorax is finer, and the body rather more shining.

Length 8—9 mill.

Not rare. Chobham, Bristol, Reigate, &c. Appears in May and June, and may be bred from pierced bramble stems.

ENTOMOGNATHUS, *Dahlb.*

Hym. Eur. vol. i. p. 295.

Differs from *Crabro* in having the eyes hairy, and the mandibles sinuate near the base.

1. *brevis*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 72.

Black; scape of the antennæ in front, dilated portion of the mandibles at the base in the ♂, the tubercles, the anterior and intermediate tibiæ and tarsi in both sexes, and the femora except a black line beneath in the ♂, the posterior tibiæ at the base in the ♀ and almost entirely in the ♂, and the posterior tarsi in the ♂, flavous; apices of the anterior femora yellow in the ♀. Head and thorax shining, rather largely punctured, covered with short erect hairs; mandibles dentate at the base; eyes clothed with fine white hairs; basal area of the metathorax shining, surrounded and divided down the middle by consute impressions, sides finely pilose; abdomen finely punctured, the posterior margins of the segments narrowly piceous, apical segment piceous; posterior and intermediate femora denticulate and spinose.

Length 5—6 mill.

Hab.—Common in most places. May be known at once from any of the black species of *Crabro*, some of which it much resembles, by the hairy eyes and dentate mandibles at the base.

CRABRO, *Fab.* (Pl. VIII. figs. 45, 46).

Syst. Ent. p. 373.

This genus contains a number of species which vary exceedingly in form and colour, but the neururation of the wings is constant throughout. The front wings have one distinct submarginal and one distinct discoidal cell, without indications of further nervures. The only other genus that I have adopted, which has similar neururation, is *Entomognathus*, which is characterised by its hairy eyes.

Crabro vestitus, Sm. Brit. Foss. Hym. p. 131, I can find no trace of in his collection, and it is omitted in his Catalogue of 1871; I have therefore omitted it, presuming it to be identical with some other species.

CRABRO:

- (4) 1. Body petiolated; 1st segment terminating in a node.
- (3) 2. Face with a blunt spine between the antennæ; apex of the tibiæ red *tibialis*.
- (2) 3. Face without a spine; apex of tibiæ black .. *clavipes*.
- (1) 4. Petiole of body, if present, very short; 1st segment not terminating in a node.
- (56) 5. Abdomen not strongly punctured.
- (41) 6. Ocelli in an equilateral triangle.
- (40) 7. Cheeks beneath without a strong spine.
- (33) 8. Abdomen entirely black.
- (22) 9. Last segment of abdomen in ♂ not more strongly punctured than the preceding, excavated in the ♀.
- (17) 10. Basal area of the metathorax not clearly defined.
- (12) 11. Posterior tibiæ very clavate and rounded, without spines or teeth *capitosus*.
- (11) 12. Posterior tibiæ more or less dentate or spinose.
- (16) 13. Metathorax with a wide central channel, which is distinctly margined; front legs of the ♂ simple.
- (15) 14. Legs entirely black *leucostoma*.
- (14) 15. Front legs testaceous-brown *pubescens*.
- (13) 16. Metathorax with a simple, narrow, central impressed line; front legs of ♂ scutate *cetratus*.
- (10) 17. Basal area of metathorax clearly defined.
- (19) 18. Puncturation of thorax so fine and indistinct as to be scarcely visible, except with a high power *podagricus*.
- (18) 19. Puncturation of thorax distinct.
- (21) 20. Clypeus black; front legs of ♂ scutate .. *gonager*.
- (20) 21. Clypeus flavous; front legs of ♂ simple .. *Aphidum*.
- (9) 22. Last segment of the body in the ♂ more strongly punctured than the preceding; not excavated in the ♀.
- (26) 23. Front legs of ♂ scutate, both sexes with the calcaria of front legs black, or with the clypeus and mandibles yellow.
- (25) 24. Larger, basal area of metathorax large, shining, and finely strigose; ♂ tibiæ scutate; clypeus and mandibles yellow *palmarius*.
- (24) 25. Smaller, basal area of metathorax small, dull, and very coarsely striate; ♂ tibiæ simple; 1st joint of tarsi scutate; calcaria in both sexes black *palmipes*.
- (23) 26. Calcaria of front legs pale; clypeus not yellow.

- (30) 27. Mesosternum spinose at the sides.
- (29) 28. Metathoracic area striated *varius*.
- (28) 29. Metathoracic area smooth and shining .. *exiguus*.
- (27) 30. Mesosternum not spinose.
- 32) 31. Thorax more or less shining; puncturation fine, but not so very close; tibiæ widely pale at the base; metathoracic area polished and shining in both sexes, rarely finely striate in the ♂ *Wesmæli*.
- (31) 32. Thorax dull; puncturation very close; tibiæ very narrowly pale at the base; metathoracic area deeply striate in the ♂, striate at the sides only in the ♀ *elongatulus*.
- (8) 33. Abdomen black and yellow.
- (37) 34. Recurrent nervure emitted just beyond the middle of the submarginal cell. (Pl. VIII. fig. 45)
- (36) 35. Posterior tibiæ of the ♂ spinose, those of the ♀ much and closely spined *dimidiatus*.
- (35) 36. Posterior tibiæ of the ♂ not spined, those of the ♀ less spined than in the preceding .. *signatus*.
- (34) 37. Recurrent nervure emitted considerably beyond the middle of the submarginal cell. (Pl. VIII. fig. 46).
- (39) 38. 2nd segment of the abdomen beneath without a pilose spot on each side *vagabundus*.
- (38) 39. 2nd segment of the abdomen beneath with a pilose spot on each side *cephalotes*.
- (7) 40. Cheeks beneath with a strong spine *4-maculatus*.
- (6) 41. Ocelli in an isosceles triangle much widest at the base.
- (53) 42. Abdomen black and yellow.
- (48) 43. Mesosternum without a short raised crest in front of the intermediate coxæ; ♂ antennæ fusiform; tibiæ patellated.
- (45) 44. Thorax above striated *cribrarius*.
- (44) 45. Thorax above not striated.
- (47) 46. Anterior angles of prothorax prominent .. *peltarius*.
- (46) 47. Anterior angles of prothorax obtuse *scutellatus*.
- (43) 48. Mesosternum with a short raised crest in front of the intermediate coxæ.
- (52) 49. Thorax punctured and sometimes longitudinally striate, but not transversely striate in front.
- (51) 50. Thorax posteriorly and scutellum striate among the punctures; 3rd abdominal segment banded with yellow *chrysostoma*.
- (50) 51. Thorax and scutellum rugosely punctured; 3rd abdominal segment entirely black *vagus*.
- (49) 52. Thorax transversely striate in front, longitudinally behind *interruptus*.
- (42) 53. Abdomen entirely black or bronzy.
- (55) 54. Abdomen bronzy black; head not wider than the thorax *albilabris*.
- (54) 55. Abdomen without a bronzy tint; head wider than the thorax *Panzeri*.
- (5) 56. Abdomen strongly punctured *clypeatus*.

1. *tibialis*, Fabr. Ent. Syst. Suppl. p. 271. Fig. Smith Brit. Foss. Hym. pl. iii. fig. 8 = Curtis Brit. Ent. xv. 656.

Black; ♂ with the scape of the antennæ, the under side of the flagellum near the base, and the whole of the 7th, 9th, and 11th joints white; ♀ with the scape and under side of the antennæ piceous; mandibles yellow at the apex in the ♂, piceous in the ♀; thorax with the tubercles and tegulæ pale in both sexes, as well as the apex of the abdomen; extreme apices of the femora, the bases of all the tibiæ, the front tibiæ entirely, and the front and intermediate tarsi white; intermediate and posterior tibiæ brown across the middle and red at the apex; posterior tarsi brown. Head and thorax shining, finely and rather remotely punctured; face between the antennæ with a blunt spine; antennæ in the ♂ with the 2nd joint transverse and triangularly produced at the side, the two following sinuate at the base, and much widened at the apex; antennæ in the ♀ simple; metathorax at the base shining, with a central impressed line, sides covered with fine white pubescence, basal area not defined laterally; abdomen shining and polished, basal segment narrow and very clavate at the apex; genitalia of the ♂ fringed with long hairs at the sides; apical segment in the ♀ carinated at the sides and covered with erect hairs; posterior tibiæ in both sexes very clavate, and armed exteriorly with irregular spines; 1st joint of the anterior tarsi in the ♂ very long and dilated, of the intermediate tarsi long and angularly produced near the base.

Length 6—7 mlll.

Hab.—Not common. I have taken it at Wandsworth. F. Smith says that it is one of the species that burrow into the pith of bramble stems.

2. *claripes*, Linn. Syst. Nat. ed. x. vol. i. p. 569 = *rufiventris*, Pz., &c. Fig. Panz. Faun. Germ. 72, 12 (*rufiventris*).

Like the preceding in shape, but differs in the following particulars: the ♂ has the scape only of the antennæ white, and the 6th only sinuate beneath, the tarsi simple, and the abdomen with a red band; the ♀ differs in having the scape of the antennæ white, the abdomen with a red central band, its apical segment not covered

with erect hairs, the posterior and intermediate tibiæ black at the apex, not red as in *tibialis*, their interior margin almost without spines.

Length 6—7 mill.

Hab.—Generally distributed. May be bred from perforated bramble sticks.

3. *capitosus*, Shuck. Foss. Hym. p. 159.

Black; the anterior tibiæ in front, the anterior and intermediate tarsi, and the extreme base of the posterior tibiæ whitish. Head and thorax finely and remotely punctured; metathorax with a transverse crenate line at its extreme base, otherwise smooth and rounded, slightly wrinkled posteriorly at the sides, and with a longitudinal channel near the apex; abdomen shining, widened towards the apex; apical segment in the ♀ with a sharp carina on each side, and impressed at the apex, covered with long erect hairs; apical segment in the ♂ shining, scarcely punctured; posterior tibiæ very clavate in both sexes, without spines.

Length 8 mill.

Hab.—London district, Chobham, Reigate, Tunbridge Wells, Dorsetshire, Yorkshire. Rare.

4. *leucostoma*, Linn. Syst. Nat. ed. x. vol. i. p. 571.

Black, shining, with the calcaria pale, as well as the base of the posterior tarsi in the ♀. Head widely channelled between the eyes, finely and remotely punctured, with erect hairs on the vertex; clypeus covered with bright silvery hairs; thorax very finely and irregularly punctured; metathorax smooth and shining at the base, with a deep central sulcature in the ♀, a shallow one in the ♂; sides of the metathorax dull, punctured, and finely pubescent, but not separated from the shining basal area by any distinct impressed line or sulcature; wings slightly brownish; abdomen shining, nearly impunctate, regularly ovate in the ♀, its widest part being about the apex of the 3rd segment; elongate in the ♂; apical segment in the ♀ acuminate, with a sharp carina on each side, and a slightly raised central ridge, the extreme apex piceous; tibiæ of the posterior legs irregularly spinose.

Length 6—10 mill.

Hab.—Generally distributed and common. The widely sulcate face will distinguish this species from any of its allies.

5. *pubescens*, Shuck. Foss. Hym. p. 165.

♂ like a small *leucostoma*, but with the face not sulcate; the head and thorax rather more hairy; the metathorax smooth at the base, and sulcate down the middle, irregularly rugose at the sides; anterior and intermediate femora and tibiæ piceous in front.

Length 7 mill.

Hab.—Charlwood, Surrey, 1 ♂; and 1 ♂ from Shuckard's collection. I do not know the ♀.

6. *cetratus*, Shuck. Foss. Hym. p. 131. Fig. H. Schöff. Faun. Germ. 179, 2, 3 (*dilatatus*).

Black, shining; the calcaria and the margins of the dilated anterior tibiæ of the ♂ pale. Head and thorax punctured, rugosely so in the ♂; clothed with short erect hairs; metathorax crenate at the extreme base; finely and diagonally rugose in the ♂ and clothed with whitish hairs; nearly smooth, and somewhat shining in the ♀; in both sexes with a narrowly impressed line down the centre; abdomen shining, the extreme apex in the ♀ piceous; apical segment in the ♀ acuminate, with a sharp carina on each side above, and clothed at the sides with erect hairs; posterior tibiæ with short spines; anterior tibiæ in the ♂ dilated and widely rounded on their outer margin, which is pale, somewhat membranous, and ciliated; 1st joint of the front tarsi in the ♂ also dilated. Length 7—8 mill.

Hab.—London district, Weybridge, Bristol, and Lanercost in Northumberland; rare.

The ♂ is distinct from all the species by the front tibiæ; the ♀ can only be confounded with *leucostoma*, from which the narrow central line of the less shining metathorax will easily separate it; in *leucostoma* the central impression is a distinct excavation, with a sharp margin on each side.

7. *podagricus*, V. der Lind. Nouv. Mem. Acad. Brux. v. p. 62.

Black; the scape of the antennæ in front, the anterior and intermediate femora in front in the ♂, and the

anterior and intermediate tibiæ and tarsi in both sexes yellow, except a black spot on the under side of the tibiæ; posterior tibiæ black; narrowly pale at the base. Head and thorax somewhat dull, very finely punctured, the puncturation only visible under a strong lens; mesothorax with a short, double, impressed line from the middle of the anterior margin; wings hyaline, with a very faint cloud along the radial cell; metathorax with a somewhat heart-shaped basal area, enclosed by a wide, well-defined consute line, the enclosure punctured and finely sulcate down the middle; from the apex of the enclosure runs a deeply-impressed channel; abdomen shining; apical segment above in the ♂ smooth, scarcely punctured, in the ♀ acuminate, and carinated at the sides with a trilobate fovea at the apex; anterior femora in the ♂ fringed with long hairs beneath; posterior tibiæ in both sexes very clavate; the outer margins irregularly dentate.

Length 6 mill.

Hab.—Generally distributed.

The exceedingly fine puncturation of the thorax will distinguish this from any other of its group.

8. *aphidum*, St. Farg. Ann. Soc. Ent. Fr. iii. p. 789
= Walkeri, Shuck., Smith, &c.

Black; clypeus, mandibles, and the scape of the antennæ, yellow; thorax with a spot on each side of the collar, the tubercles and tegulæ yellow; scutellum and post-scutellum in the ♀ generally with a yellow spot, often wanting in the ♂; ♂ with the anterior and intermediate legs, except the base of the femora above, yellow; posterior legs, with the base of the tibiæ widely, and 1st joint of the tarsi, yellow. The ♀ has the anterior knees only yellow, and a black spot on the tibiæ of the anterior and intermediate legs. Head and thorax punctured; clypeus covered with shining, silvery hairs; metathorax with a shining basal area, crenate at the extreme base, bounded by a consute line, and divided down the middle by a consute impression; abdomen regularly ovate, finely punctured, and clothed with a somewhat sparse grey pubescence; tibiæ in the ♂ without spines or teeth on their outer margin.

Length 7 mill.

Hab.—Very rare. I have Shuckard's type of the ♂,

and Mr. C. W. Dale has sent me a ♂ and ♀ for examination, taken in Dorsetshire.

9. *gonager*, St. Farg. Ann. Soc. Ent. Franc. iii. p. 785.
= *ambiguus*, Dhlb. Hym. Eur. p. 336.

Black; anterior tibiæ paler at the apex and anterior margin; 1st and 2nd joints of the anterior and intermediate tarsi white; the basal joint of the anterior tarsi with three black spots; posterior tibiæ narrowly pale at the base; all the calcaria pale.

♂ shining; head and thorax finely and somewhat remotely punctured; metathorax with a shining enclosure at the base, surrounded by a wide crenate sulcature, and divided down the middle by a narrow crenate line; metathorax below the enclosure irregularly rugose; abdomen finely punctured, and covered with fine very short hairs, which are only observable under a high power; anterior tarsi with the basal joint widely scutate, pale, with three round black spots; the 2nd, 3rd, and 4th joints also dilated and pale, each smaller than the one preceding it; the 2nd and 3rd each with a small black spot in front; posterior tibiæ irregularly spinose on their exterior margin.

♀ with the anterior tarsi simple; the scape of the antennæ, the anterior tibiæ in front, and the posterior tibiæ widely at the base, pale; apical segment of the abdomen canaliculated.

Length 6—7 mill.

I have only seen the ♂ of this species, of which Mr. Vincent Perkins has had the good fortune to take several in Gloucestershire, to whom I am indebted for the specimen described.

10. *palmaris*, Schreb. Naturf. xx. p. 100, pl. ii. fig. 9,
♂ (1784) = *scutatus*, Fab., Dahlb., Smith, &c.

Black; mandibles, clypeus, scape of the antennæ in front, a line on the prothorax, and the post-scutellum yellow in both sexes; the ♂ has also the cheeks just above the mandibles and on their under side, the tubercles, and the under side of the prothorax, and the scutellum yellow; anterior and intermediate legs in the ♂ yellow; the femora beneath, an irregular spot at the apex of the dilated anterior tibiæ, and the 1st joint of the tarsi posteriorly black; intermediate tibiæ black

beneath; posterior legs, with the base of the tibiæ and tarsi only, yellow; ♀ with the anterior and intermediate tibiæ in front, the posterior tibiæ at the base, the anterior tarsi entirely, and the base of the others, yellow; head finely punctured, slightly channelled in front; clypeus and face below the antennæ covered with brilliant silvery hairs; thorax rather more shining than the head, and not so finely punctured; mesothorax with a double dorsal line in front; sides of the mesothorax covered with bright silvery hairs, and with a slight spine posteriorly; metathorax with a very finely striate basal area, which has a central consute impression; abdomen shining, very finely punctured; apical segment in both sexes with a few very large scattered punctures; front femora in the ♂ swollen; tibiæ largely dilated and membranaceous posteriorly; tarsi with the basal joint produced and dilated; intermediate and posterior legs simple, as well as all the legs in the ♀; posterior tibiæ in both sexes with pale spines on their outer margin.

Length 7—8 mill.

Local; Birch and Darenth Woods, Southend, Devonshire, Lowestoft, Wimbledon, &c.

11. *palmipes*, Linn. Syst. Nat. ed. xii. 1, p. 944 = *tarsatus*, Shuck.

Smaller than the above; black, shining; scape of the antennæ in front, two transverse spots on the collar; ♂ with a transverse spot on the scutellum, the anterior legs in front, the intermediate tibiæ in front and at the base, the posterior tibiæ at the base, and the basal joint of the intermediate tarsi, yellow; ♀ with the anterior tibiæ in front, and the base of the other tibiæ and tarsi, pale. Head finely punctured with a narrow dorsal line; thorax not quite so finely punctured as the head; metathorax crenate at the base, divided down the middle by a wide consute channel, on each side of which is a transverse, somewhat raised space, which is deeply and diagonally striate; metathorax towards the apex transversely rugose; mesothorax posteriorly with a distinct lateral spine beneath; abdomen finely punctured; anterior tarsi in the ♂ with the basal joint dilated posteriorly, its margin rounded, the 2nd and 3rd joints produced on each side, and triangular; legs in the ♀ simple.

The ♂ is easily known by its dilated tarsi; the ♀ is very like that of *varius*, but the black calcaria of the front tibiæ are a distinguishing character; the spines of the mesopectus are rather more developed, and the crenate line round the basal area of the metathorax deeper.

Length 6—7 lines.

Hab.—London district; Deal; Shanklin, Isle of Wight; Bristol. Mr. Bridgman has taken both sexes at Norwich.

12. *varius*, St. Farg. Ann. Soc. Ent. Fr. vol. iii. p. 775.
= *spinipectus*, Shuck.

Very like the preceding, but the ♂ differs in having the anterior tarsi simple and the calcaria pale, the ♀ in having the calcaria pale and the other characters pointed out at the end of the last description, also in sometimes having a yellow spot on the scutellum; the basal joint of the anterior tarsi in the ♂ has a black central band, which will easily distinguish it from any of its other allies; the ♀ might be confounded with *anxius* on account of the spines on the mesopectus, but the striate basal area of the metathorax easily separates it from that species.

Length 6 mill.

Hab.—Generally distributed, and not rare.

13. *anxius*, Wesm. Hym. Foss. Belg. p. 137 = *exiguus*, Shuck. Foss. Hym. p. 174.

Black, shining; mandibles piceous at the apex; scape of the antennæ yellow beneath; collar with two small yellow spots; tubercles in the ♂ of the same colour; apex of the abdomen in both sexes testaceous; ♂ with the femora, tibiæ, and tarsi of the anterior and intermediate legs yellow in front; posterior tibiæ yellow at the base; ♀ with the anterior and intermediate tibiæ and tarsi yellow in front; posterior tibiæ yellow at the base; basal joint of the tarsi pale. Head and thorax finely punctured; mesothorax in front with three slightly raised lines; metathorax crenate at the base; the basal area shining and almost smooth, divided down the middle, and surrounded by wide, deeply crenate impressions; mesopleura each with a minute spine-like tooth; abdomen ovate, shining; tibiæ spinose exteriorly.

Length 5—6 mill.

Hab.—Battersea Fields, Shuckard. Earlham, Suffolk, Bridgman.

This is a very distinct species, and one of our smallest; from *varius*, which is the only other one of this section with a spine on the mesopleura, it differs in the shining, almost smooth basal area of the metathorax, and from all the species in the regularly ovate shape of the abdomen.

14. *Wesmaeli*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 65.

Black, shining; scape of the antennæ yellow in front; sometimes with a spot on each side of the collar, the tubercles, and the scutellum yellow; apex of the abdomen testaceous; femora yellow at the extreme apex in both sexes, and beneath in the ♂; anterior and intermediate tibiæ yellow, except a black line behind; posterior tibiæ widely yellow at the base; tarsi with the basal joint pale, the rest more or less fuscous. Head and thorax punctured; metathorax with the basal area shining, surrounded by wide crenate lines, and divided down the middle by a narrow crenate line; metathorax below the basal area also bounded at each side by a crenate impression, and with a central crenate line; abdomen finely punctured; tibiæ spinose on their outer margin; intermediate tibiæ simple.

Length 5—6 mill.

Common, and generally distributed.

15. *elongatulus*, V. d. Lind. Nouv. Mem. Acad. Brux. v. p. 64 = *propinquus*, Shuck.; *hyalinus*, Shuck.; *obliquus*, Shuck.; *pallidipalpis*, Shuck.; *transversalis*, Shuck.; *luteipalpis*, Smith; *scutellaris*, Sm.; var. *proximus*, Shuck.

Very like *Wesmaeli* in the ♀, but both sexes may be easily distinguished thus:—The ♂ of this species has the mandibles, palpi, anterior femora and tibiæ in front, and generally the intermediate tibiæ in front, yellow; the rest of the insect black; the basal area of the metathorax very deeply strigose and dull; the intermediate tibiæ rather suddenly thickened just below the base; the ♀ has the legs much darker than in *Wesmaeli*, the tibiæ being pale only at the extreme base of the intermediate and posterior pairs; the scutellum black, and the apex of the abdomen scarcely piceous; the puncturation of the thorax is distinctly closer and finer, and the surface less brilliant;

the area of the metathorax finely striate near the margins.

Length 5—6 mill.

London district, Chobham, Hastings, Norwich, &c.

16. *dimidiatus*, Fab. Ent. Syst. ii. p. 298. Fig. Panz. Faun. Germ. 46, 8.

Head and thorax black; mandibles more or less piceous, and sometimes yellow; scape of the antennæ in the ♀ yellow, with a black line above; two spots on the collar, a line on the post-scutellum, and sometimes the scutellum itself yellow; abdomen with a band on the basal segment near the apex, two small round spots on the 2nd segment, two larger transverse lateral spots on the 3rd and 4th, and nearly the whole of the 5th and 6th yellow. The ♂ is generally darker, having the 5th and 6th segments often unspotted, and the 7th pale at the apex; in some ♀ the body is nearly entirely yellow, with only a narrow black band at the base of the 2nd and 3rd segments; in some ♂ the body is nearly entirely black, with only a narrow band on the basal segment, and a spot on each side of the 3rd, yellow. ♂ with the anterior and intermediate tibiæ in front, and the posterior tibiæ at the base, and sometimes also near the apex, and all the tarsi, yellow; ♀ with all the tibiæ and tarsi yellow, with generally a black spot on the former in front. Head shining, shallowly punctured; vertex with two deep impressions united posteriorly in the ♀, and the face channelled; these impressions are less strongly marked in the ♂; thorax somewhat shining and shallowly punctured in the ♂, dull and very closely punctured in the ♀; metathorax with the basal area shining, crenate at the base, surrounded by an impressed line, and widely sulcate down the centre; sides of the metathorax more or less hairy, especially in the ♂; abdomen shining, somewhat petiolated, with the basal segment about once and a half as long as wide, regularly elongate-ovate, apical segment in the ♀ largely punctured; posterior tibiæ in both sexes irregularly spinose; anterior tibiæ in the ♂ triangularly produced near the base beneath.

Length 12 mill.

Hab.—Common in many places, and generally distributed.

17. *signatus*, Panz. Faun. Germ. 53, 15.

Very like *dimidiatus*, but differing in the following particulars:—The ♂ has the tibiæ without spines, and the posterior femora with a small tooth near the base beneath; the ♀, according to Wesmael, differs in having the petiole of the body slightly thicker and shorter, each of the excavations of the vertex divided in two by an oblique carina, and the tibiæ entirely yellow without spots. Thomson says that the tibiæ also are less spinose.

Length 11—12 mill.

The ♂ only appears to have occurred in England, but I suspect the ♀ is overlooked for that of the preceding species. The ♂ has been taken at Swansea by Mr. Dossetor, and at Eaton, near Norwich, by Mr. Bridgman.

18. *vagabundus*, Panz. Faun. Germ. 53, 16.

Head and thorax black; scape of the antennæ beneath, the entire collar or two spots on it, and a spot on the scutellum in the ♀, yellow; abdomen black; ♂ with the 2nd and 3rd segments having a transverse yellow lateral spot on each side, the 6th segment with a central transverse spot, and the 7th generally pale, sometimes the 4th segment also with two lateral spots, and the 5th with a central one; ♀ with a narrow band on the 1st segment, a broad interrupted band at the base of the 2nd and 3rd, a continuous band on the 4th, and the whole of the 5th yellow; apical segment more or less piceous; legs in the ♂ yellow, with the femora above and the whole of the posterior pair black; intermediate and posterior tibiæ more or less black at the apex; ♀ with the femora black; tibiæ and tarsi yellow. Head and thorax rugosely punctured, hairy, vertex of the former impressed; antennæ simple in both sexes; cheeks not spined; basal area of metathorax shining, smooth, surrounded by a deeply consute impression, and with a wide central consute sulcature, the rest of the metathorax somewhat rugose and hairy; abdomen shining; basal segment almost as wide at the apex as long, not petiolated; apical segment in the ♀ subacuminate above, sulcate at the apex, beneath with the 2nd segment without lateral pilose spots; front femora in the ♂ toothed beneath; all the femora in both sexes fringed on their under side. Length 9—13 mill.

Common.

♂ something like *4-maculatus*, but without the spinose cheeks. ♀ very like *chrysostoma* in colour, but the different arrangement of the ocelli distinguish it at once.

19. *cephalotes*, Panz. Faun. Germ. 62, 16; Smith, &c.
= *sercinctus*, Sm. = *interstinctus*, Sm. ?

Larger than the preceding. Head and thorax black; the ♀ with two spots on the collar, and sometimes a spot on the scutellum, yellow; the scape of the antennæ and mandibles in both sexes yellow; the ♂ with the former striped with black above; abdomen with a wide yellow band on each segment, the 1st, 2nd, and 3rd sometimes narrowly interrupted; ♂ with the anterior and intermediate femora and tibiæ yellow in front, and more or less black behind; posterior femora black, with a yellow spot near the apex; all the tarsi yellow; ♀ with the apices of the femora, and the whole of the tibiæ and tarsi, yellow. Head and thorax finely punctured, the latter finely and longitudinally striate, the former in the ♀ sometimes very large; vertex slightly impressed, hairy in front; clypeus and margins of the eyes densely covered with golden or silvery hairs, the former carinated; antennæ in the ♂ with 3rd, 4th, 5th, and 6th joints much widened at the apex, and produced into a blunt tooth; ♀ antennæ simple; thorax hairy; metathorax longitudinally rugose in front, transversely behind; abdomen smooth and shining, basal segment hairy above, apical segment in the ♀ narrowly acuminate and sulcate, densely fringed with bristly testaceous hairs at the sides, that of the ♂ fringed with fine, somewhat curved hairs; 2nd segment of the abdomen beneath with a dull round spot at the side near the base; posterior and intermediate tibiæ denticulate, spinose in the ♀.

Length 12—15 mill.

Common.

Easily distinguished from the preceding by the dentate antennæ of the ♂, and the narrow setose apical segment of the abdomen in the ♀, as well as by the striate thorax in both sexes.

20. *quadrimaculatus*, Fab. Ent. Syst. ii. p. 294, var. *2-maculatus*, St. F.; *geniculatus*, Shuck. Fig. Smith, Brit. Foss. Hym. pl. iii. fig. 7.

Black; mandibles piceous; thorax often with two spots on the collar, and the post-scutellum, yellow; abdomen

with occasionally a narrow sinuous band on the basal segment, a transverse spot on each side of the 2nd and 3rd segments, rarely united, a spot on each side of the 4th, varying much in size, and the whole of the 5th yellow; apical segment piceous; every variation of colouring seems to exist between this and an entirely black abdomen; the ♂ has rarely more than a lateral spot on each side of the 2nd and 3rd segments; femora black, those of the ♂ yellow in front, except the posterior pair; tibiæ yellow, black posteriorly, posterior tibiæ yellow at the base; tarsi of anterior and intermediate legs yellow, of posterior legs piceous. Head and thorax shining, punctured; head with a distinct well-marked spine on each cheek beneath; prothorax straight in front, its angles right angles; metathorax crenate at the extreme base, basal area shining, widely sulcate down the middle, and bounded at the sides by a crenate line; metathorax at the sides hairy, and transversely rugose; abdomen finely punctured, somewhat elongate-oval; apical segment in the ♀ flat above, with a few large rugose punctures; posterior tibiæ in the ♀ spinose, in the ♂ with a few prominent spine-like hairs.

Length 8—10 mill.

Hab.—Common.

This very variable species may be known at once by the spine on the cheek beneath.

21. *cribrarius*, Linn. Syst. Nat. ed. x. vol. i. p. 573, Fig. Panz. Faun. Germ. 15, 18, ♂, 15, 19, ♀.

Head and thorax black; scape of the antennæ with a yellow spot near the apex in the ♀; two spots on the collar in both sexes, and the scutellum in the ♀ also, yellow; abdomen black, with a continuous band near the apex of the 1st segment, an interrupted band on the 2nd and 3rd, and a continuous band on the 4th and 5th yellow; in the ♂ there is a yellow band also on the 6th and 7th; the ♀ has the apical segment testaceous above; femora black; tibiæ and tarsi yellow; patellæ of the front tibiæ in the ♂ pale, spotted with small white spots; apex of the basal joint of the front tarsi and the whole of the following joints black. Head punctured, hairy, finely strigose between the eyes; antennæ in the ♂ fusiform; mesothorax longitudinally and rugosely striate, sparsely clothed with brownish hairs; metathorax

finely rugose, with a crenate central channel, and covered with long hairs, especially in the ♂; abdomen shining, elongate in the ♂, rather wider in the ♀, but much longer than in the species preceding; apical segment in the ♀ triangular and strongly punctured, flat above, and covered with short golden hairs; anterior femora in the ♂ short and swollen, produced behind into a large irregular 5-sided process, and with a sharp short spine quite at the base; anterior tibiae in the ♂ thickened, with a large membranous patella extending from their outer margin; tarsi much dilated, interior claw very long, bisinuate, and apiculate; front legs in the ♀ simple; intermediate and posterior tibiae strongly spinose in both sexes.

Length 13—15 mill.

Common in sandy places.

22. *peltarius*, Schreb. Naturforsch. 20 Stück. 98, 3, pl. ii. fig. 6 = *patellatus*, Panz., Smith, Shuck., &c.

Very like the preceding, but smaller, and at once distinguishable by the simply punctured, not striate, head and thorax; the ♂ with the front femora produced posteriorly into a flat, membranous, yellow, shining process, with a narrow, almost hair-like spine at the base; coxæ spined; tibiae with the patellæ striped with white posteriorly.

Length 11—13 mill.

Common in sandy places.

23. *scutellatus*, Schev. Naturforsch. 20 Stück. 89, 6. — *pterotus*, Fab. Syst. Piez. p. 311, Dlb., Smith, &c.

Very like *patellatus*, but rather smaller; both sexes have the head and thorax duller, and more closely and rugosely punctured; the prothorax without prominent anterior angles; the ♂ may be known at once by the shape of the anterior femora, the flattened process of which in this species is somewhat triangular, with its external basal angle produced and dentate; whereas in the preceding species it is rounded; the patella of the tibiae is also differently marked, the stripes from the margin continued and irregularly united on the disk, and the external claw is flattened and somewhat twisted; the ♀ has the basal segment of the abdomen unspotted, the abdomen itself wider in proportion to its length,

and the tubercles often black and the scape of the antennæ black.

Length 9—10 mill.

Guildford, Dr. Capron ; and near Chobham.

24. *vagus*, Linn. Syst. Nat. ed. x. vol. i. p. 571. Fig. Panz. Faun. Germ. 46, 10.

Black ; scape of the antennæ, except the base above, a spot on each side of the collar, an interrupted band at the base of the 2nd segment of the abdomen, sometimes, but rarely, a small spot on each side of the 3rd, two wide lateral spots or a continuous band on the 4th and 5th yellow ; femora black, yellow at the extreme apex in the ♂, and on the anterior legs in front ; tibiæ yellow, narrowly black at the apex, anterior and intermediate pairs black beneath ; tarsi with the basal joint pale in the ♂ ; pale only on the posterior legs of the ♀. Head closely punctured, hairy ; 6th joint of the antennæ in the ♂ much constricted at the base ; thorax hairy, finely and closely rugose ; metathorax with a defined basal area, sulcate down the centre ; sides of the mesothorax beneath transversely rugose ; abdomen shining, finely punctured, ovate in both sexes, apical segment in the ♀ very narrow and acuminate, shining, rugose, with a slight carina at each side, sides below the carina with a dense fringe of pale bristly hairs ; intermediate and posterior tibiæ dentate and spinose in the ♀.

Length 10—13 mill.

Hab.—Common.

The black 3rd segment of the body gives this species an appearance by which it may be easily recognised.

25. *chrysostoma*, St. Farg. Ann. Soc. Fr. vol. iii. p. 704. = *xylurgus*, Shuck.

Head and thorax black ; the former with the mandibles and the entire scape of the antennæ in the ♀, and the scape of the antennæ in front in the ♂, yellow ; clypeus and margins of the eyes covered with shining golden hairs in the ♀, silvery in the ♂, the latter with a small spot on each side of the collar, and sometimes a spot on the tubercles, yellow ; abdomen black, banded or spotted with yellow, having two small spots or a narrow band on the basal segment, and two lateral transverse spots on each of the 2nd, 3rd, and 4th

segments in the ♀, and also of the 5th in the ♂; those of the 2nd and 4th sometimes uniting so as to form transverse bands; 6th segment in the ♂, and 5th in the ♀ black only at the apex, 6th segment black in the ♀, 7th piceous at the apex in the ♂; femora black, more or less yellow towards the apex above in the ♂; tibiæ yellow, more or less black beneath; tarsi yellow, dusky towards the apex. Head and thorax hairy, finely and rugosely punctured; antennæ in the ♂ with the 3rd and 4th joints somewhat swollen and widely produced at the apex into a sort of rounded tooth, the 5th, 6th, and 7th joints very slightly dentate at the apex; antennæ in the ♀ simple; clypeus carinated; vertex with a narrow impressed line running into the impression of the face above the antennæ; mesothorax posteriorly, and scutellum, slightly longitudinally striate among the punctures; metathorax clathrately rugose in front, transversely rugose towards its apex, with a wide shallow, crenate, central impression; abdomen shining, finely punctured, apical segment in the ♀ very narrow and acuminate, deeply sulcate, its sides densely covered with long testaceous bristly hairs; tibiæ spined in the ♀, and more or less denticulate.

Length 10—12 mill.

Hab.—Generally distributed. F. Smith says he has several times reared the sexes from pieces of willow-stumps.

26. *interruptus*, DeGeer. Mem. ii. 2, 807, pl. xxv. fig. 10—15 = *Lindenius*, Shuck., Smith, &c.

Somewhat like *chrysostoma*, *cephalotes*, &c., in coloration, but very distinct from all the species of the genus in the sculpture of the thorax. The mesothorax is transversely and rather deeply striate in front and at the sides, longitudinally striate posteriorly; the scutellum is longitudinally striate, the metathorax longitudinally rugose near the base, transversely so near the apex, with a central impression, crenate near the base. The thorax in the ♀ has also two yellow spots on the collar; the tubercles, the scutellum, and a small spot on each side of it also yellow; antennæ simple in both sexes.

Length 12—15 mill.

Hab.—Not common. Darent, Southgate, Ripley, Bristol, Suffolk, &c.

27. *albilabris*, Fab. Ent. Syst. ii. p. 302. Fig. Panz. Faun. Germ. 15, 24 (*leucostoma*).

Black, with more or less of a bronzy tint, especially in the ♂. ♂ with the apex of the scape of the antennæ, an interrupted line on the collar, the tubercles, tegulæ, apices of the femora, the tibiæ and tarsi flavous; ♀ with the tegulæ piceous, anterior tibiæ yellow in front, all the tibiæ yellow at the base; extreme apex of abdomen testaceous. Head and thorax punctured, the thorax more finely so than the head; clypeus covered with silvery hairs; thorax as wide as the head; division between the mesothorax and scutellum consute; metathorax longitudinally rugose at the base, not sulcate down the centre, basal area indicated by a narrowly-impressed line surrounding it, sides of the metathorax beyond this line rugose, apex below it somewhat shining and sulcate; abdomen finely punctured, covered with a short decumbent greyish pubescence; apical segment in the ♀ flattened above and carinated at the sides, coarsely punctured and covered above with short golden hairs; posterior tibiæ spinose, especially in the ♀.

Length 7—8 mill.

Hab.—Common on Umbelliferae, &c., in many places, in July.

28. *Panzeri*, V. de Lind. Nouv. Mem. Acad. Brux. v. p. 69.

Very like the preceding, but black without the bronzy tint. Both sexes may be known from it by the wider head, which is decidedly wider than the thorax. The ♂ may be known besides by the entirely black thorax, by the strong spine on the cheek beneath, and the yellow mandibles; the ♀ by the yellow mandibles, and clear yellow scape, tibiæ, and tarsi, a yellow spot on each side of the collar, tubercles, and sometimes a spot on the scutellum. In this species the yellow seems to predominate in the ♀, in the preceding in the ♂.

Length 7—8 mill.

Hab.—Rare. Darenth, Birch Wood, Weybridge, Isle of Wight, &c.

29. *clypeatus*, Linn. Syst. Nat. ed. xii. i. p. 945. Fig. Panz. Faun. Germ. 46, 5 (*vexillatus*) = *vexillatus*, V. de Lind., &c.

Black; the scape of the antennæ in front, and two large lateral spots on each of the 1st four abdominal segments, a continuous band on the others, the anterior and intermediate legs in the ♂, except the anterior femora beneath, the posterior tibiæ and tarsi, except a triangular spot on the former, yellow; the ♀ has the femora of all the legs black, except at the extreme apex; the tibiæ and tarsi yellow; beneath in ♂ with a quadrate yellow spot on the 2nd segment, and a narrow band on the 3rd of the same colour. Head deeply punctured, triangular, and constricted posteriorly from the vertex into a narrow neck in the ♂, the face very narrow between the eyes, large and quadrate in the ♀, sides of the head very hairy in the ♂; thorax very largely and deeply punctured, much constricted in front in the ♂ and elongate; prothorax in the ♀ with its anterior angles spinose; metathorax rugose in both sexes, with a wide central crenate line; abdomen largely and coarsely punctured; apical segment in the ♀ very narrow and acuminate, and deeply sulcate; front tarsi in the ♂ much dilated, the 1st joint with a large subquadrate patella.

Length 9—10 mill.

Hab.—Weybridge, F. Smith. I have a ♂ and ♀ from Shuckard's collection without note of locality.

OXYBELUS, *Latr.* (Pl. VIII. fig. 47).

Prec. *Caract. Gen. Ins.* p. 129.

Differs from the other genera of this family in having the submarginal cell confluent with the discoidal cell, *i. e.*, only separated from it by a very indistinct nervure, the scutellum bearing a wing-like appendage on each side, and the metathorax a curved spine near the base.

- (2) 1. Abdomen covered with long silvery pubescence .. *mucronatus*.
 (1) 2. Abdomen not covered with silvery pubescence.
 (4) 3. Mandibles yellow *mandibularis*.
 (3) 4. Mandibles black.
 (6) 5. Segments of the body less finely punctured; legs entirely black in ♀ *nigripes*.
 (5) 6. Segments of the body more finely punctured; legs not entirely black in ♀ *uniglumis*.

I have omitted the following species, described by Shuckard and Smith as British, as their claims to a place in our fauna seem to me to rest on very doubtful authority:—*bellicosus*, Oliv., *14-notatus*, Oliv., *nigricornis*, Shuck., *bipunctatus*, Oliv., and *nigroaeneus*, Shuck.

1. *uniglumis*, Linn. Syst. Nat. ed. x. vol. i. p. 573.
Fig. Panz. Faun. Germ. 64, 14.

Black; antennæ towards the apex, beneath fulvous; thorax with the tubercles in the ♀ pale, and the tegulæ in both sexes; abdomen with a whitish spot on each side of the 1st and 2nd segments of the ♂ and of each of the segments of the ♀ except the 6th; legs with the tibiæ and tarsi fulvous, and the extreme apex of the femora in the ♀. Head and thorax rugosely punctured, covered with short hairs, those on the face, in front of the antennæ, bright silvery; wings subhyaline, nervures pale; scutellum with a central carina; wing-like appendages of the post-scutellum pale, subtriangular, acute; spine of the metathorax short and rounded at the apex; metathorax traversed by fine elevated lines, basal area defined by an elevated line intersecting these others, sides with an elevated ridge running nearly parallel to the sides of the basal area; abdomen dull in the ♂, shining in the ♀, its puncturation very fine and close, especially on the 2nd and following segments, its surface covered with short grey hairs, longer in the ♂ than the ♀; tibiæ and tarsi with pale spines.

Length 6—9 mill.

Hab.—Common in many sandy places, and generally distributed.

2. *mandibularis*, Dbm. Hym. Eur. i. p. 514.

♂ closely allied to the above, but having the mandibles flavous at the base and rufescent at the apex, the spots of the abdomen of a more distinct yellow, and the puncturing of the segments, especially of the 2nd and following, much stronger, and more scattered; thorax with the tubercles and a spot on each side of the collar flavous; the femora are black, with their apices pale, and the front tarsi are broadly flavous beneath; the tibiæ flavous, more or less reddish at their extremities, the 1st and 2nd pairs with a streak behind, and the 3rd with a broad band near the apex, black; tarsi rufescent.

Length 6 mill.

Hab.—Littlehampton, one ♂; one ♂, C. W. Dale; and one ♂, loc. ?, J. B. Bridgman. I only know the ♂ of this species. According to Thomson the ♀ also should have pale mandibles, and the 2nd ventral segment of the abdomen very closely and finely punctured in the middle.

3. *nigripes*, Oliv. Encycl. Meth. viii. p. 596.

♀ differs from either of the preceding in having the metathoracic spine narrow and truncate at the apex, the abdomen spotted only on the 1st and 2nd segments, and the legs black, with the exception of the front tibiæ, which are fulvous, as well as all the tarsi, the other tibiæ very narrowly pale at the base.

Length 8 mill.

One specimen, ♀, taken by Mr. S. Stevens in Devonshire.

4. *mucronatus*, Fab. Ent. Syst. ii. p. 300. Fig. Smith Brit. Foss. Hym. pl. iii. fig. 6 — *argentatus*, Cur. — *ferox*, Shuck.

Recognisable at once by the fine, narrow, pointed metathoracic spine and the silvery pubescence with which the entire insect is covered; the ♂ with a lateral spot on each of the 1st five segments of the abdomen; ♀ with a transverse spot on each side of the 1st three segments, and a band on the 4th and 5th.

Length 8—9 mill.

Hab.—Bristol; Liverpool; Deal; &c. Not common.

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ERRATA.

P. 257, line 3 and line 7 from top, *for mesopleuræ read mesopleura.*

P. 261, line 4 and line 5 from bottom, *for mesopleuræ read mesopleura.*

EXPLANATION OF PLATE VIII., FIG. 41.

Giving nomenclature of nervures and cells.

- | | |
|--------------------------|----------------------------------|
| 1. Costal cell. | a. Costal nervure. |
| 2. Externo-medial cell. | b. Post-costal nervure. |
| 3. Interno-medial cell. | c. Externo-medial nervure. |
| 4. Anal cell. | d. Anal nervure. |
| 5. Marginal cell. | e. Posterior margin. |
| 6. 1st submarginal cell. | f. Stigma. |
| 7. 2nd ,, | g. Radial nervure. |
| 8. 3rd ,, | h. Apical margin. |
| 9. 4th ,, | i. Externo-medial nervure |
| 10. 1st discoidal cell. | (extension of c.) |
| 11. 2nd ,, | j. Transverse medial nervure. |
| 12. 3rd ,, | k. Discoidal nervure. |
| 13. 1st apical cell. | l. External nerve of 1st submar- |
| 14. 2nd ,, | ginal cell. |
| | m. External nerve of 2nd submar- |
| | ginal cell. |
| | n. External nerve of 3rd submar- |
| | ginal cell. |
| | o. Cubital nervure. |
| | p. 1st recurrent nervure. |
| | q. 2nd ,, |
| | r. Subdiscoidal cell. |